Safety Maintenance

AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE • DECEMBER, 1960 • 50¢
Published By Alfred M. Best Company, Inc.

EXTRA WIDE VISION, MORE SAFETY, MORE COMFORT

in new Bausch & Lomb Chemical Workers* Goggle

Wherever vision and comfort are improved, accidents are less likely to happen. When they do happen, you want maximum protection.

This new B&L goggle helps all 3 ways: improves vision, provides more comfort, gives maximum protection.

Made of molded rubber, with soft-rolled edges, it shuts out chemical vapors while it gives up to 15% wider field of vision. B&L impact-resistant safety lenses, in S-7 shape, measure 66 x 59 mm. Deep lens grooves assure positive lens seating.

Forest green rubber is acid-resistant, easy to clean. The goggle fits over any modern ophthalmic frame. Rubber headband adjusts in a twinkling.

Ask your supplier to show you this model now.

**Available with or without vents, with BalSAFE glass or Enduron hard resin lenses for other uses.*

BAUSCH & LOMB

Protection-PLUS Safety Products

protection + economy + worker acceptance

(For details, use Key # Z-1 on card on page 1)

LOSS STOPPERS

The bulletins and catalogs reviewed below are offered by the Reader Service Department of *SAFETY MAINTENANCE*. To obtain copies without cost or obligation, write in the key numbers on the Reader's Inquiry Card.

MISCELLANEOUS

Translucent Building Panels 434
Panel Structures, Inc. New catalog features a complete line of translucent panels, window walls, and curtain wall system. Describes these in detail with full size and scale drawings of all panel types and accessory framing sections.

Electronic Solution Controller .. 435
Electro Mechanisms Corp. Bulletin describes automatic control of concentration of caustic, acidic or aqueous solutions in either continuous or batch-type metal washing equipment, and other applications where precise concentrate levels must be maintained. System's components are enumerated and discussed.

Skylights 436
The Marco Co. Two-color catalog contains up-to-date information on the company's complete line of aluminum and fiberglass skylights, roof scuttles, fire vents, etc. Previously issued literature is condensed in this catalog which contains descriptions of all models and designs.

Vacuum Sheet Lifters 437
Vac-U-Motion Div., Littell Machine Co. Colorful catalog includes descriptions of a variety of manually-operated and completely automatic sheet lifters. Some models have capacities for handling up to 2,000 lbs. The units are sold to shorten the number of man-hours required and to cut handling costs.

Ventilators and Fans 438
Coppus Engineering Corp. Handsomely illustrated 20-page folder contains extensive information on various ventilators, blowers, hoss, and man-cooling fans, etc. In addition to helpful application data, the booklet also features numerical capacity tables for the different units, and detailed structural diagrams.

Sander for Vehicle Traction 439
Highway Safety Appliances. Four-page colored brochure describes dispenser units which attach to truck body, in front of rear wheels, and drop grit on the roadbed. This enables vehicles traveling on icy roads to gain sufficient traction to prevent slippage.

FIRE PROTECTION

Safety & Oily Waste Cans 440
Justrite Mfg. Co. New bulletin describes various types of cans designed to reduce fire hazards due to benzine, oily rags and waste. Plunger and bench cans are among those discussed. All are engineered to safely contain flammable and volatile liquids. Approved by UL.

Safety Rated Roofing Shingles .. 441
Philip Carey Mfg. Co. Two-page data sheet describes and lists specifications of asbestos-plastic shingles carrying a UL rating for Class "A" fire hazards. Other information includes explanation of a quick-set adhesive which provides roof protection from wind and storms.

PLANT MAINTENANCE

Explosion Proof Floor Machines .. 442
Hild Floor Machine Co. Literature describes scrubbing and polishing machines for floors, as well as vacuum cleaners for wet and dry pick up in hazardous areas. All units described are UL listed, and are designed for chemical and petroleum tanks, grain mills, gunpowder plants, etc.

Anti-Slip Wax Ingredient 443
Du Pont de Nemours & Co. Colorful booklet outlines how microscopically small spheres of colloidal silica are mixed among the larger globules in some floor waxes in order to promote underfoot safety. The minute particles act in such a way upon the softer wax globules that the end result is safer, more comfortable walking.

TOOLS AND GUARDS

Punch Press Guards 444
Junkin Safety Appliances. Well illustrated catalog goes into the question of primary and secondary punch press operations, and discusses how maximum protection increases press production and lowers insurance rates.

Die Feeding Pliers 445
Osborn Mfg. Co. Nine-page two-color brochure surveys extensive line of feeding tools, with a photograph and brief description of each model. The pliers are made of an extremely light aluminum alloy that will prevent die breakage.

Circular Saw Safety Tool 446
Bratt-Guard Corp. New safety tool literature including a special wall chart is contained in a six-page booklet. The booklet features a specially engineered transparent plexiglas guard unit that covers the saw blade yet allows full vision and complete ac-

(Continued on next page)

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Free Bulletins (Cont'd)

curacy in saw cuts such as dadoing, diagonal sawing, rabbeting, including ripping and long cross cutting.

PERSONAL PROTECTIVE EQUIPMENT

Fluorescent Work Gloves 447
Granet Corp. Descriptive brochure gives details on fluorescent gloves designed for night work, jobs where hand signals are important, etc. In addition to increased visibility, the vinyl-coated gloves are slip and abrasion resistant.

PVC Clothing 448
Jomac, Inc. Four-page booklet with two-color illustrations depicts and describes a line of polyvinyl chloride protective garments that include coats, suits and coveralls. The lightweight apparel is weather and abrasion resistant and is impregnated for resistance to solvents and chemicals.

INDUSTRIAL HYGIENE

Cots and Stretchers 449
Washington Products Co. A complete line of ambulance cots, stretchers, cot fasteners and other equipment for emergency use is featured in this catalog. Included are various elevating and folding models. Ample photographic illustrations.

Emergency Dousing 450
Haws Drinking Faucet Co. Well illustrated catalog describes eye fountains which are used to wash away searing chemicals from the eyes and facial areas. Also covered are showers which blanket the body with water directed from several different angles.

WARNING & COMMUNICATIONS

Accident Prevention Signs 451
Stonehouse Signs, Inc. 64-page catalog in full color extensively surveys complete selection of signs which draw attention to every hazardous condition. Signs are designed in accordance with American Standard specifications.

What's Your Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Number Key	Subject
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
109	Safety Belts
110	Safety Gloves
112	Anti-Slip Soles
113	Oil-Resistant Soles
114	Welding Helmets
	FIRST AID AND HYGIENE
122	Sanitary Drinking Facilities
124	Salt Tablets
125	Resuscitator Tubes
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
129A	Stretcher Cases
130	Throat Medication
131	Eye Wash Fountains
131A	Emergency Showers
132	Portable Ventilators
133	Dust Collectors
135	Hearing Protectors
136	Noise Analysis Equipment
137	Noise Mufflers
138	Athlete's Foot Preventive
	FIRE PROTECTION
139	Fire Retardant Paint
140	Fire Extinguishers
141	Safety Cans
142	Fire Alarms
143	Safer Solvents
144	Degreasing Machines
145	Drum Safety Valve
146	Asbestos Textiles

Key Number	Subject
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149	Fire Blankets
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154	Emergency Lights
	MAINTENANCE
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162	Floor Cleaning Compounds
164	Floor Resurfacing Compounds
163	Floor Cleaning Machines
166	Floor Mats
167	Insulating Tape
168	Ultrasonic Flaw-Detector
169	Machine Motion Analyzer
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170	Ladders
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180	Safety Tools
181	Vacuum Sheet Lifters
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	EDUCATIONAL AIDS
191	Safety Signs
192	Safety Awards & Emblems
193	Employee Safety Guide
195	Changeable Letter Signs
196	Safety Poster Kit
197	Safety Training Films

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Safety Maintenance

formerly "SAFETY ENGINEERING"

Volume 120, Number 6 **December, 1960**

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Cover Picture: Denny's No Dummy in industrial safety. Featured in four new films developed by The Dow Chemical Company, Denny's advice adds up to this—Wear protective clothing and use good sense. For details about the four films, see page 53.

AMERICA'S PIONEER INDUSTRIAL SAFETY MAGAZINE

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it's SAFE to say

● OVER OUR SHOULDER

Traditionally, the twelfth issue of a year in the life of a publication offers the opportunity, as well as the temptation, to cast a backward glance over the editorial shoulder. With the approach of December, SAFETY MAINTENANCE yields to this temptation.

It has been said that the more things change, the more they remain the same (automobile body stylists to the contrary notwithstanding). Never has this proverb been given more meaning than in the field of safety. While technological developments bring new hazards which in turn necessitate new control measures, the basic principles remain the same—the ultimate objective of protecting human and material resources against the consequences of industrial accidents.

Unlike the tactics employed in the heat of the recent election campaign, now happily a memory, safety leaders neither bemoan the passing of the good old days nor do they advocate reconstructing the entire premise of safety precepts. In this field at least, we neither rest on our slightly withered laurels nor do we consign to the trash heap formulas successful in the past.

A review of the past offers convincing proof of the futility of change merely for the sake of change. It is a truism that hazards undreamed of a short time ago now constitute a brand-new, daily threat to life, limb and property safety. Nevertheless, actual quotations from this column strengthen the belief in the potency of pre-nuclear weapons with which to fight the causes and results of accidents:

"Aside from the complex employer-employee relationship, the solution of the accident problem stems from the combined efforts of the safety engineer, the psychologist (often the same), the labor department, the insurance company, the safety association, the press, the plant doctor, the safety equipment manufacturer and the plant nurse."

January, 1928

"The National Society for the Prevention of Blindness is carrying on a valuable and necessary work in attacking and preventing one of the most lamentable and pathetic conditions, the depths of whose agony no words can describe and for which there is an estimated economic loss of millions of dollars a year."

January, 1928

"On more than one occasion, this publication has emphasized the high cost suffered by industry because of preventable infections following industrial injuries. The infections are caused largely on account of lack of prompt first aid treatment for infection prevention, particularly in the case of minor injuries. Infections resulting from injuries caused by handling sharp and rough objects cost $820,000 in one state alone in just one year, whereas in the same period, non-infected cases cost $187,000."

February, 1928

"We hear continually of the importance of the chief executive's interest in the plant's industrial accident prevention campaign. But when it comes right down to preventing accidents in a group of industrial workers year in and year out, the foreman is the first man who can show results."

March, 1928

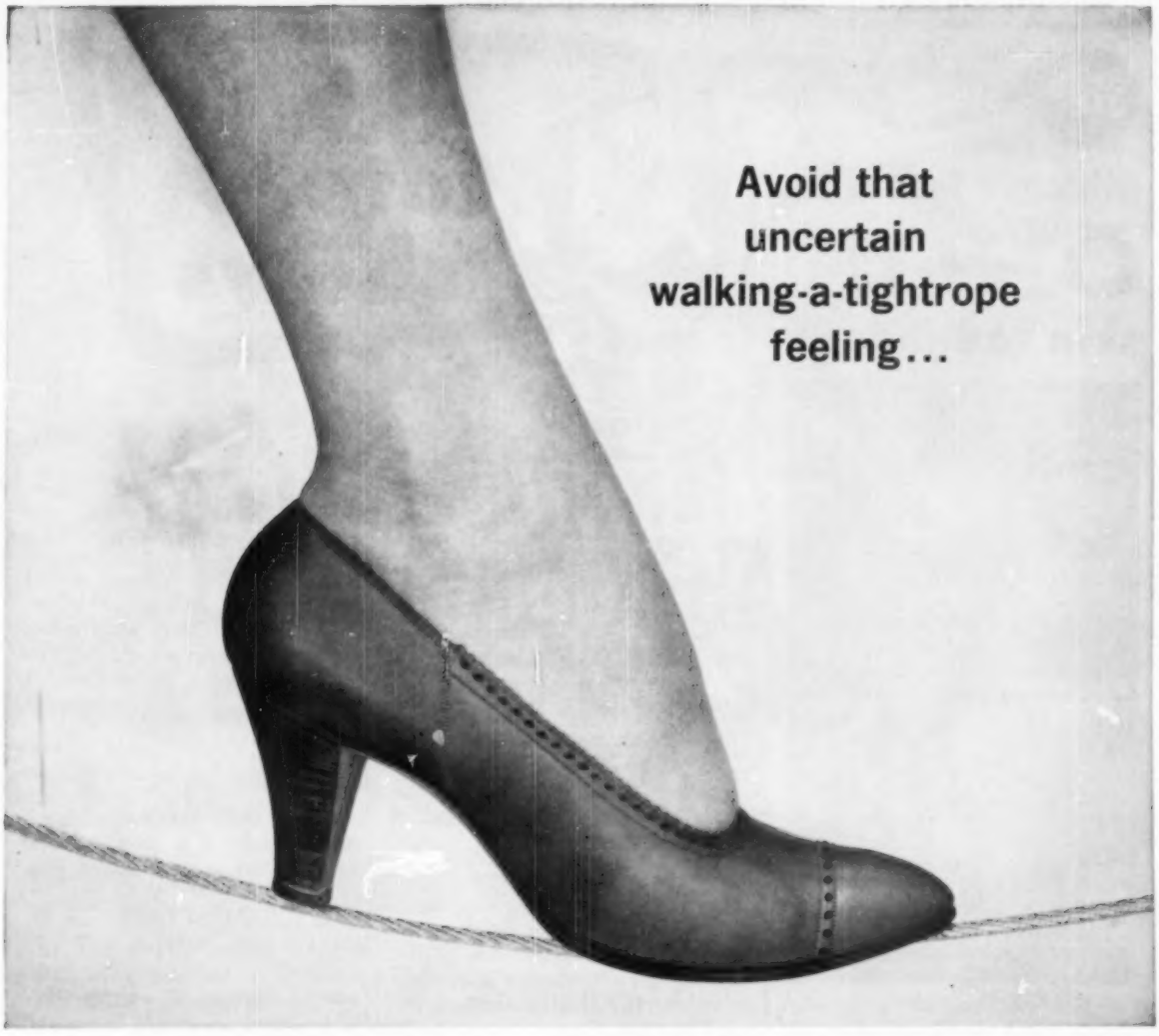
"So long as people continue to utilize combustible material and give insufficient attention to the needs of fire control and choosing the right fire fighting equipment for the job, so long will the fire demon destroy beyond redemption vast amounts of valuable property and thousands of lives a year."

April, 1928

"In the use of spray guns, the most harmful health hazards are materials whose ingredients contain benzol and other highly volatile solvents, lead compounds and vitreous enamels. However, many materials in common use can be sprayed with a reasonable degree of safety provided proper precautions are taken through the use of adequate ventilation and appropriate personal protective equipment."

May, 1928

So what else is new? The more things change, the more they remain the same.



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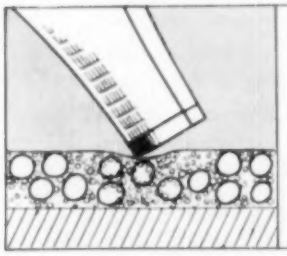
With "Ludox" in the floor wax you get added safety underfoot. "Ludox" acts like a brake that promotes easy, effortless walking. And you get the lasting beauty only a fine wax can give your floors. Scratches and scuffs can be buffed out without rewaxing. For more information and a list of suppliers, write us or mail coupon below.



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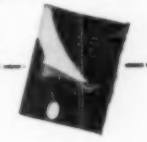

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(For details, use Key # Z-2 on card on page 1)

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*American Pub. Health Assoc., Oct. 15, 1954

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(For details, use Key # Z-3 on card on page 1)

New York, N. Y. *December 12–15*

Industrial Building Exposition & Congress (Coliseum). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Chicago, Ill. *January 23–26*

Twelfth National Plant Maintenance & Engineering Show and Conference (International Theatre). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

San Francisco, Calif. *February 9–10*

Eleventh Annual Governor's Industrial Safety Conference (Biltmore Hotel). Michael Flagg, Coordinator, 455 Golden Gate Ave., San Francisco, Calif.

Philadelphia, Pa. *March 1–2*

Twenty-Seventh Annual Regional Safety-Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, Executive Director, Safety Council, Chamber of Commerce of Greater Philadelphia, 121 S. Broad St., Philadelphia 7, Pa.

Atlanta, Ga. *March 5–7*

Twenty-Second Annual Southern Safety Conference and Exposition (Atlanta Biltmore Hotel). W. L. Groth, Executive Director, P. O. Box 8927, Richmond 25, Va.

Fort Wayne, Ind. *March 14–15*

1961 Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, Manager, Safety Council, Chamber of Commerce Bldg., Ft. Wayne, Ind.

Los Angeles, Calif. *March 28–30*

Eighth Annual Western Safety Conference & Exhibits (Ambassador Hotel). Joseph M. Kaplan, Manager, Greater Los Angeles Chapter—National Safety Council, 3388 W. 8th St., Los Angeles 5, Calif.

Boston, Mass. *April 3–4*

Fortieth Annual Massachusetts Safety Conference and Exhibit (Hotel Statler Hilton). Bert Harmon, Manager, Massachusetts Safety Council, 54 Devonshire St., Boston 9, Mass.

Toronto, Ont. *April 10–11*

44th Annual Meeting & Safety Show of the Industrial Accident Prevention Associations (Royal York Hotel). R. G. D. Anderson, General Manager, Industrial Accident Prevention Associations, 90 Harbour St., Toronto 1, Ont.

New York, N. Y. *April 10–14*

Thirty-First Annual Greater New York Safety Convention and Exposition (Statler Hilton Hotel). William J. Farley, Convention Director, Greater New York Safety Council, 60 E. 42nd St., New York 17, N. Y.

Durham, N. C. *May 10–12*

Thirty-First Annual North Carolina Statewide Industrial Safety Conference (Jack Tar Durham Hotel). H. S. Baucom, Director of Safety, North Carolina Industrial Commission, Raleigh, N. C.

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world's standard of safety since 1906

(For details, use Key # Z-5 on card on page 1)

CHECK LIST of aids to production

Through Accident Prevention—

Non-Slip Surfacing 13
Heat-Reflective Clothing 14
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New ABC-Rated Extinguishers 63
Foam Fire-Fighting Unit 64

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Company _____

Address _____

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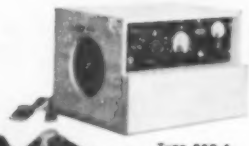
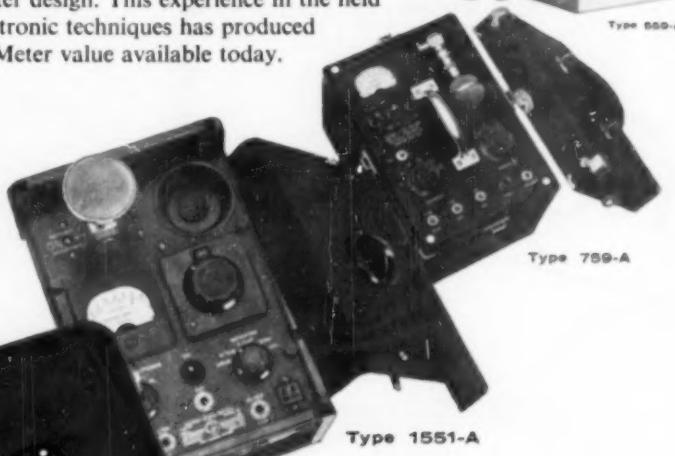
(For details, use Key # Z-6 on card on page 1)

Experience

27 years of experience in the design and manufacture of sound-measuring equipment lie behind the General Radio Type 1551-B Sound-Level Meter. Since 1933, a continuous development program has been in process, bringing with it many refinements and innovations in Sound-Level-Meter design. This experience in the field coupled with advances in electronic techniques has produced the finest Sound-Level-Meter value available today.





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- ★ Low cost . . . **$415**
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SAFETY UNDERFOOT:

Two Types of Automatic Snow Removal Systems

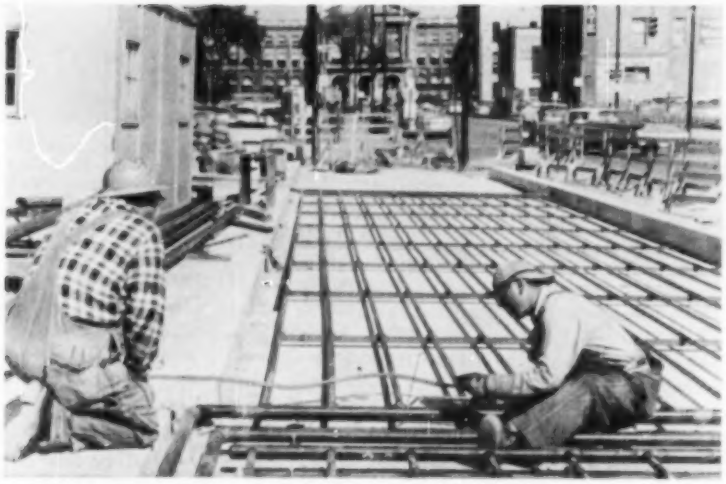


Fig. 2: This snow melting system, installed in the sidewalk at an Ohio plant, was fabricated from wrought iron pipe. Heat transfer oil, circulated through concrete-enclosed pipe system, will warm the terrazzo topping, melt ice and snow.

Fig. 1: Heated piping system being installed in the driveway and sidewalks at Eastman Kodak Co.

Automatic snow removal assures safe traffic for pedestrians as well as motor vehicles and eliminates costly snow maintenance problems. The latest automatic snow removal systems in Rochester have been installed by Eastman Kodak Company for their office building—in the driveway and adjacent sidewalks, and in sidewalks fronting the building.

The systems are turned on in late fall and operated through the winter. A heat exchanger is used to warm a mixture of water and ethylene glycol to a temperature of 140 degrees F. A pump circulates the solution through a network of wrought iron pipe buried in the driveway and sidewalks. Snowflakes touching the warm blacktop surface melt quickly. (See Figure 1.)

Designed by Eastman's Engineering Department to combat Rochester's annual snow accumulation of 75.6 inches, the system will melt one inch of snow per hour.

The contractor first laid four inches of gravel. A subslab of six inches of concrete was poured over the gravel. The 1-inch and 1¼-inch diameter wrought iron pipe, laid on 12-inch and 18-inch centers, was placed on the sub-slab and covered with four inches of concrete and 1½ inches of bitumastic material.

Wrought iron snow melting systems have practically been a standard specification in Rochester, N. Y., ever since the first snow melting system in the world was installed there in 1925 at Rochester Gas and Electric Company. The original wrought iron pipe coils in this system are still steaming away without failure each winter, and to date have melted a total of 211 feet of snow.

At the new 15-story Libbey-Owens-Ford Glass Company's

Fig. 3: The wrought iron piping grid system for one of the sidewalk areas of the office building of the New England Telephone Company in New Haven, Conn.

building in Toledo, Ohio, an automatic snow melting system provides underfoot safety for three sidewalks, each 14 x 180 feet, and a 60 x 85 foot entrance way. (See Figure 2.)

The grid system utilizes 1-inch diameter pipe laterals welded to 2-inch diameter headers and is fabricated from corrosion resistant wrought iron pipe. The grids are laid in a depressed concerte slab on grade, and encased in 5 inches of concrete. A terrazzo topping is then placed over the entire plaza area. When operating, heat transfer oil is circulated at 140 to 160 degrees F.

Three sidewalks skirting the $12 million Southern New England Telephone Company's new General Office Building in New Haven, Conn., have also been equipped with an automatic snow melting system to keep pavement clear of ice and snow.

Covering an area of 9,100 square feet, including entrances to the building, the ¾-inch diameter snow melting grids were laid on 12-inch centers, then enclosed in five inches of concrete—three inches above pipe and one inch below. The system was hydrostatically tested six hours under 125 pounds of pressure. In operation, it will convey a mixture of ethylene glycol and hot water. (Figure 3.)

Wrought iron pipe was also used in this new office building for steam condensate return lines, and the exhaust system for the auxiliary emergency generator.

Winter shoppers at the Eastwood Shopping Center, near Pittsburgh, will be protected from the hazards of icy sidewalks by vinyl insulated heating wires installed just below the surface of the walks. Insulated with rugged Geon 8800 to provide protection from abrasion and corrosion, the heating wire will make snow and ice removal a thing of the past.

The special thermal wires (See Figure 4) are also designed to be used on roofs to prevent the formation of ice dams. The low cost and ease of installation make it adaptable for use in business, industrial or residential installations.

Circuit "Loops" Used

At Eastwood, circuit "loops" 190 feet in length were used. This heating wire was taped to ordinary reinforcing wire to prevent its displacement when the top layer of concrete was poured over it. The reinforcing wire was then stacked and delivered to the construction site where it was placed on the sidewalk's sublayer. A three-fourth inch concrete top layer was then poured over it.

The heating units come in three basic types: cable for underground and roof installations; tape with a built-in thermostat for heating water pipes; and band also designed for pipe heating but available with either a manually operated external, or a built-in, thermostat.

Once installed, the heating units become permanent, all-weather installations as the Geon insulation resists the most adverse conditions. The units operate on standard 110/120 volt house current.

Figures 1-3 from A. M. Byers Co. Figure 4 from B. F. Goodrich Co. and Edwin L. Wiegand Co.

Fig. 4: Vinyl-insulated electric heating wire, embedded in concrete, melts ice and snow from sidewalks. In this picture, the heating wire is being taped to a reinforcing wire grid to hold heating wire in place before concrete is poured.

A.S.S.E. Elects

Five officers and three elected members-at-large to the Executive Committee, governing body of the American Society of Safety Engineers, were installed at the Society's Annual Meeting on October 17 in Chicago.

The new national officers, all of whom were elected for one year terms, are George L. Gorbell (president), manager of safety and fire protection, Monsanto Chemical Company, St. Louis, Mo.; John V. Grimaldi (first vice president), consultant for safety and plant protection, General Electric Company, New York City; Michael F. Biancardi (second vice president), manager of safety services, Allis-Chalmers Manufacturing Company, Milwaukee, Wis.; Frank E. Laderer (treasurer), director of safety, Nationwide Insurance, Columbus, Ohio; Alfred C. Blackman (secretary), managing director, American Society of Safety Engineers, Chicago, Ill.

The three members-at-large, elected to the Executive Committee for three year terms to represent those members of the Society who are located in areas where no Society chapters have been organized, are Thomas J. Berk, safety consultant, Metropolitan Life Insurance Company, New York City; Samuel McKay Jr., supervisor of safety, Bell Telephone Company of Pennsylvania, Philadelphia, Pa., and Clyde F. Schuleter, accident prevention manager, Employers Mutuals, Wausau, Wisc.

The American Society of Safety Engineers, with headquarters in Chicago, has 75 chapters located throughout the United States.

SLIPPERY WALKWAYS SLIP-PROOFED

1. Durable surfacing compound is brushed on loading ramp, sprinkled with abrasive grit, second coat applied.

2. The skid-proof surface provides safe footing for shipping room personnel. Ramp was slippery from rain and oil.

3. Wheel slippage of fork lift trucks has been overcome by the special surface coating on steel loading ramps.

When Consumers Power Company occupied its new Bay City, Michigan, Service Center last year, safety was regarded as an automatic built-in feature.

However, a problem soon developed on two hydraulically-operated steel ramps at the side of the building where four or five trucks are unloaded daily. Moisture from the weather, and oil drippings from fork lift trucks caused a slippery condition for both foot and vehicular traffic. Frequently, when the ramps were positioned for unloading operations, fork lifts could not gain traction, and personnel had difficulty maintaining their footing. Storeroom employees, who were required to stock over 5,000 articles in the building, were hampered considerably at the loading docks by these conditions.

To offset the hazard and improve operations, a surface coating compound was applied to the steel ramps early in 1960. The application covered the entire 5 x 7-ft. area on each ramp. Results to date show that ramp slipping hazards no longer menace personnel, and vehicles operate without traction difficulties. (See figures 1–3.)

The coating compound was applied to the ramps like paint. While wet, the first coat was sprinkled with an abrasive grit used in conjunction with the compound. After an hour's drying time, excess particles were swept away leaving the remaining grit embedded in the coating. A second coat was applied to seal in the grit and anchor it firmly in place. Tiny grit edges protrude through the coating to provide non-slip ramp surfaces. *

A yellow coating was applied to the ramps to harmonize with the building's safety color scheme. Bright oranges and yellows have been employed to keep employees alert to hazardous areas.

Feeding 4 x 8-foot sheets of Granite Board into a large rip saw—an area in which there is danger from slipping or falling—has become an almost routine processing operation at the Granite Board Division plant of National Starch and Chemical Corporation at Goffstown, N. H.

Just one of many reasons for present routine nature of this work is the application of a non-skid surfacing material to the wooden floor in the saw machine area.

The plant produces a particle board made from wood fibres that are blended and mixed with binders and hot pressed to a desired thickness. Board is made in 4 x 8-foot sheets, 15 at a time, with thickness varying from ⅜ to 1⅛ inches. Before sanding, inspection and shipment the board is cut to customer-specified sizes. During this phase, the saw operator stands on a wooden floor that often becomes slippery from fine sawdust thrown from the machine.

Seeking to reduce accidents before they occurred, Robert A. Maxwell, maintenance supervisor, working closely with Randall Marden, safety supervisor, decided to use paint with sharp sand spread across the top to make the area safer afoot. Other pre-mixed non-skid paints were also tried. These experiments

(Continued on page 50)

* For the name and source of the anti-slip product described in this and the following two applications, readers are invited to consult the Editors.

4. Wooden floor around rip-saw became very slippery from fine sawdust in cutting Granite board to size. The long-lasting abrasive coating on the floor now gives operator secure footing in hazardous area.

For Hot Jobs, Reflect the Heat

REFLECTING SHIELDS AND CLOTHING TAKE THE HEAT OFF HOT JOBS

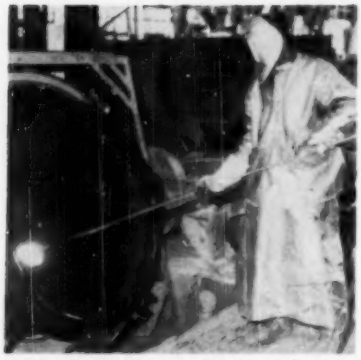


Fig. 3: Enameler, wearing aluminized reflective clothing, inspects fired vessel before applying next coat. Vessel, just out of furnace, is 1600-1640 F.

Fig. 4: Enameler, applying finely milled glass, shows need for flexible clothing.

by **R. J. McWILLIAMS**
Chief Ceramist
The Pfaudler Co.
Elyria, Ohio

The manufacture of alloy and glassed steel equipment for corrosive service is a highly specialized industry. The problems incurred through the use of heat in the necessary production operations require special handling. To this end, protective devices utilizing aluminum have been used with great effect.

Most of the published literature on problems of decreased worker efficiency due to heat exposure deals with methods of controlling the velocity, temperature, or moisture content of the air. Recognized but relegated to a secondary role has been the influence of the mean radiant temperature of solid surroundings. The use of ventilating systems, fans, water-washed air systems, and air conditioning installations have, as a consequence, become widely recommended as satisfactory relief measures in most industries. In our particular industry and to a large extent in the metalworking industries, greater benefits are derived through the control of radiant heat exposure.

In some respects we have been fortunate. The nature of the operations involved in the manufacture of glassed steel equipment precludes the use of monitored air systems. Realizing this, investigation of such systems has been limited and our efforts directed towards methods for controlling radiant heat exposure. A brief look at the operations required for the production of this equipment will serve to illustrate the problem.

The glassing operation is closely related to the porcelain enameling of steel. The major differences are that the glass used is considered more of a true glass than is porcelain enamel and that the equipment design is considerably more complex. While porcelain enameling deals with gauge sized steel and uniform sections, glassed steel equipment utilizes steel plate one quarter inch to two inches thick with wide variances in section thickness. The finished glass thick-

Figs. 3-7—Glass Enameling

Fig. 5: Enameler's leggings have open back. Coat is aluminized fiberglass.

Fig. 6: In completing the glass application, operator wears aluminized asbestos bib-apron, leggings, spats, mitts and mask. Coat is aluminized fiberglass.

Fig. 1: Furnace leader hooking up fired column section for removal from furnace car bottom. Column is fired at 1600 F.

Fig. 2: Loader, who is guiding fired column section from the furnace, wears an open-back aluminized asbestos coat.

ness is substantially heavier than that encountered in porcelain enameling.

As in porcelain enameling, two basic methods of application are used, dry process and wet process. Regardless of the type of application method used, sudden or spot cooling such as might be introduced by special blowers or man-cooling fans would result in high rejection rates.

In wet process methods each individual coat of glass is applied by spraying or other suitable method, dried, fired, and cooled to room temperature. With these methods, individual operators are seldom required to approach the hot ware for prolonged periods of time. The radiant heat exposure problem therefore is not great.

Of much greater concern is the degree of radiant heat exposure arising from our dry process operations. In this type of operation, only the initial coat is sprayed or otherwise applied and dried. After firing of this initial coat, all subsequent coats are applied while the ware is at temperatures of 1500° Fahrenheit or higher. In these subsequent application operations, the workers may be required to work within inches of the hot ware. The time required for application may reach 25 minutes.

When not actively engaged in the glassing operations the operators are continually exposed to radiant heat from their solid surroundings. This is generally felt to be of little consequence and is compensated for through the use of normal ventilation. In addition the operators have built up a tolerance for the imposed heat load over a period of years.

This heat load is frequently increased due to the close proximity of our furnaces. While one crew may be in between operations, that of an adjacent furnace may be engaged in the dry processing of ware.

In the dry process method of application, the glass is applied in the form of finely milled particles. (Figures 3-7). If the surrounding air velocity is too great, application of the glass is made difficult and uniformity of application is affected. In addition, the temperature of the ware may decrease to the point where it is impossible to complete the glass application.

Fabricating Problems

In the fabrication operations preceding the actual glassing, radiant heat exposure is also a problem. The various hot forming operations are generally such that monitored air systems would reduce their effectiveness.

A good share of the alloy equipment produced for severe corrosive service requires the use of high temperature annealing following fabrication. In addition, dependent on the particular alloy used, rapid quenching from these high temperatures is required. In such instances it is frequently necessary for personnel to work in close proximity to the ware. Since the temperatures encountered are considerably higher than those used in the glass lining process, the heat exposure problem is more acute. (See Figures 1-2.)

Protective clothing and protective shields for personnel have been the most effective means found to date for reducing discomfort due to radiant heat. Over a period of

Operations

Fig. 7: Aluminized shield in background protects nearby areas from high heat.

years the design and choice of materials used for protective clothing have undergone many changes. These revisions are being made continually. As new materials appear on the market, trials are made. Changes in design are frequently made on the advice of the individual operator.

At present the bulk of our protective clothing is made up of aluminized asbestos cloth backed up with felt or other insulating material. Each operator is equipped with mitts, leggings, aprons, coats and/or jackets, helmets, and special arm sleeves. The operator selects the various items of apparel to be used for a specific operation.

Important Factors

There are several factors that must be taken into consideration when designing protective clothing for such use. We have found the following to be of most consequence:

1. **The maximum amount of protection the base material will afford.** *The greater the ability to reflect radiant heat, the higher the degree of protection obtained.*
2. **The weight of the material.** *This is extremely important in order to prevent the imposition of an undue fatigue load on the operator. In connection with this we try to cut out or eliminate material in those areas where exposure is not a problem. For instance the back of our coat is open. In place of material, leather straps are used to hold the back together.*
3. **Flexibility of the material is very important.** *The material must be flexible enough to permit unrestricted movement of the operator and to reduce the fatigue factor. (See Figure 4.)*
4. **The equipment must be tailored to fit the operator properly.** *Ill fitting equipment affects the performance of the operator.*

In addition to the above, such factors as initial cost, life expectancy, and maintenance are also considered.

As mentioned earlier, we are continually seeking better materials of construction for our clothing. At present we are investigating such materials as aluminized fibreglass, aluminized cotton duck, and aluminum sprayed asbestos.

Protective Shields Effective

While protective clothing has been the major area of interest, we have used, with great success, protective shields faced with aluminum. These shields when interposed between areas of high radiant heat emissivity and personnel, have been highly successful. In addition to their effectiveness, the ease and low cost with which they may be erected has been particularly satisfying.

In general these shields have consisted of a wood frame faced with light gauge metal or plywood. This facing, in turn, is covered with aluminum foil. In some instances cardboard has been used for the backing material. The weight of the aluminum foil used is determined by the degree of physical abuse the shield is apt to absorb. If the shield is to be portable or semi-portable, foil having a thickness in the range of .006 to .010 of an inch is used. On permanent shields, foil having a thickness of .004 of an inch is used.

Widely Accepted

These shields were introduced gradually to our personnel and have now gained universal acceptance. The proof of their success has been evidenced by the reactions of the workers and their requests for other shields. In past years the men would request blowers or fans whereas they now request aluminum faced shields.

A most effective combination, where vision is a prerequisite, has been the use of aluminum faced shields equipped with windows of infra-red reflecting glass. At present we have about 3,000 square feet of aluminum faced shielding installed.

From an address presented at the 46th National Safety Convention. Pictures by courtesy of The Pfaudler Co., Div. of Pfaudler Permutit, Inc.

Innovations at the Plant Maintenance Conference

A better balance between the managerial and technical aspects of maintenance will feature the 1961 Plant Maintenance & Engineering Conference, according to L. C. Morrow, general chairman.

The conference will be held during the first three days of the four-day Plant Maintenance & Engineering Show in Chicago, Jan. 23 through 26. The exposition and morning sessions of the conference will be held at the International Amphitheatre. Evening sessions of the conference will be held at the Palmer House.

Both events are produced by Clapp & Poliak, Inc., New York, exposition management firm. The show is one of the largest annual industrial expositions in the country. The exhibit area will exceed six acres and about 375 major companies are expected to exhibit. Theme for the 1961 show and conference is "The Maintenance Operation Meets the Needs of Increased Production."

Besides balancing the managerial and technical aspects of the conference, several other innovations will mark the 1961 program, according to Mr. Morrow. Among them will be "problem sessions" for 11 specific industries and a discussion of "Insuring Cleanliness in the 'White Room'." White rooms are those where extraordinary precautions against contamination must be taken.

Another change this year is the scheduling of all morning sessions for the entire group. This large audience will divide into 10 groups for participation in concurrent evening sessions.

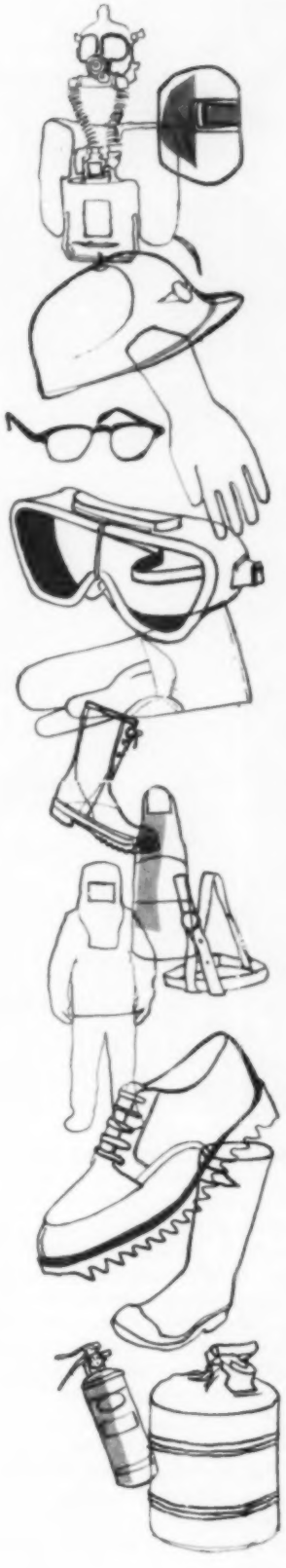
Topics for the major sessions are "The Design, Application and Results of Our Plant Maintenance and Engineering System," "Case Reports in Preventive Maintenance," "Managerial Controls for Plant and Maintenance Engineers" and "Evaluation of Plant Engineering and Maintenance Performance."

At "problem" sessions visitors will be asked to submit, several

(Continued on page 57)

FORTY-EIGHTH

National Safety Congress



Chicago was once again the scene of everyone's battle against accidents, as the National Safety Council marshalled its leading safety authorities during the week of October 17–21. In this, the 48th Annual National Safety Congress, representatives of industry, government, education, and fire and hygiene organizations from all 50 states, Canada and other countries exchanged ideas on how to combat accidents at work, at home, at leisure, and on the highways.

At the same time, safety's biggest show of the year exhibited the latest developments in new and improved products and equipment to prevent accidents, ranging from protective clothing, machine guards, and fire extinguishing equipment through first aid supplies, skin cleansers, non-slip waxes, floor machines, safety signs, safety training aids and all the other types of safety devices so vital in preventing accidents and injuries.

The Congress sessions presented speeches by safety authorities, round-table discussions and film showings. They dealt with both general problems found in all plants and also the specific problems of individual industries. Following are comments made by some of the speakers at the various meetings.

Safety Training

Theme of the convention, and it's a continuing campaign of the National Safety Council, was "Safety . . . Everywhere . . . All the Time." Its purpose is to promote safety as a round-the-clock job.

E. L. Duggan, superintendent of safety for Atchison, Topeka & Santa Fe Railway Co., Chicago, revealed how strongly he supports the belief that "safety can't be put on like a glove when a man reports for work, and taken off at the end of his tour of duty."

"When we talk about safety of a person," he said, "we are talking about the 'whole man,' and not about a person divided between on the job and off the job."

"Safety," declared Duggan, "is all-inclusive. We must treat the whole man if we are to be successful in our safety educational work. We should want people to be safe wherever they are or whatever they may be doing."

He said everyone gains by practicing safety. "When we treat the whole man in safety," he pointed out, "we serve the cause of accident prevention throughout the nation.

"Those who have the responsibility for leading others to a safer life have a great trust placed in them—one that requires a depth of thought and understanding that will help combat the normal tendency of human beings to forget their safe welfare.

"Safety is not only a way of life. Without safety there may be no life at all."

The accident situation is becoming one of America's major social and economic problems.

J. O. Musick, of the Texas Safety Assn., Austin, Tex., lashed out at "the unabated destruction of life and property" which he said has come about "since mass production has made us a civilization of modern machinery."

He said accidents of all kinds each year take the lives of more than 90,000 persons, injure more than nine million persons, and cost the nation 13 billion dollars.

"I will not say accidents, in themselves, have become a plague. But

(Continued on the next page)

A SAFETY IDEA

Realistic Training for Smoke-Eaters

The San Francisco Fire Department has installed a smoke generator as part of the equipment used in their training program. This smoke generator was originally designed for smoking meat; however, it has several characteristics which are valuable in training fire-fighting personnel:

(1) The volume and density of smoke produced may be controlled at the machine. This enables instructors to pre-determine the conditions they want to simulate, and to achieve such conditions in a few minutes.

(2) Smoke from this generator is cool and relatively non-toxic. This is an important safety factor in training beginners who have not yet achieved efficiency in respiratory protection.

Assistant Chief Henry A. Lindecker, Director of Training, and Alexander A. Potter, Supervising Captain of Training, find that the use of this smoke generator improves their teaching techniques. For beginners, the cool, clean smoke is relatively rare. This enables the trainee to adjust to working in smoke without fear and without risk of personal injury; and instructors are better able to observe and direct recruits. As the class advances, the smoke is heated and the density multiplied until it simulates conditions in the worst kind of basement fire.

In the San Francisco Fire Department, Division of Training, the smoke generator is located in the basement of the drill tower, and it discharges into an adjacent room used for training. Smoke is distributed where required by blowers. Heat is applied by connection with a furnace.

Picture by courtesy of Meat Packer Equipment Co.

I do think that the citizens' complacency toward the accident menace has become a social disease," he declared.

"A civilization that travels at speeds faster than sound, that measures the speed of planets and stars, that splits the atom, surely can cope with the accident problem."

Musick said some of the causes of accidents include carelessness, ignorance, inattention, haste, discourtesy, fatigue, intoxication and poor physical condition of machines or people.

"Accident prevention," he said, "imposes a dual obligation on each man—the common sense action of self-preservation, and the positive approach of protecting others."

"Safety doesn't cost—it pays!"

Do safety campaigns really prevent accidents, or are they just a lot of useless talk?

Clinton H. Hoch, staff representative of the NSC coal mining section, pointed to a 26 percent reduction in injury frequency during the first six months of a coal mining safety campaign as evidence of its effectiveness. The campaign was aimed at preventing injuries from a coal mining problem—falls of roof, face or rib.

Hoch said that during the first six months of the campaign, 223 fewer injuries occurred in participating mines than during a comparable length of time before the campaign.

"Twenty-one of these would have been fatal injuries," he declared.

"Think of this tremendous saving in human lives. Think of the tremendous saving in accident costs to the coal companies involved.

"These savings certainly justify all the expense, time and effort that has been put forth in this much-needed humanitarian venture."

During the past fifty years, the accomplishments of industry in reducing worker injuries has been as remarkable as its achievements in improving production efficiency.

According to James F. VanNamee, accident prevention administrator for the Westinghouse lamp division, who made the above statement, safety and production are not unrelated since management scientists long ago discovered that accidents seriously impair production.

Mr. VanNamee told his audience that accident prevention is a vital topic to every one concerned with the management of a business. It is the catalyst that combines all companies—whether they be large or small—in a common effort—that effort being toward reducing the staggering toll of accidents—and the improvement of conditions under which people work, play, and live.

The progress that has been made to date is, in large part, due to the adoption of well conceived and well executed safety programs that have provided for optimum participation by line supervision.

Despite the progress that has already been made, we still have a long road to travel, he said, if we are to further improve upon this impressive record. One of the areas in need of intensification, and which can contribute to the goal of further improvement, can be found in the field of supervisory safety training.

Because line supervisors are a part of management, they should be likened to the cutting edge of a tool, management's tool, Mr. VanNamee stated. They are right at the point of contact between employees and management; translating management plans, objectives, and programs into actual accomplishments.

"Like any cutting tool, they must be 'sharp' if their job is to be performed well. When a skilled me-

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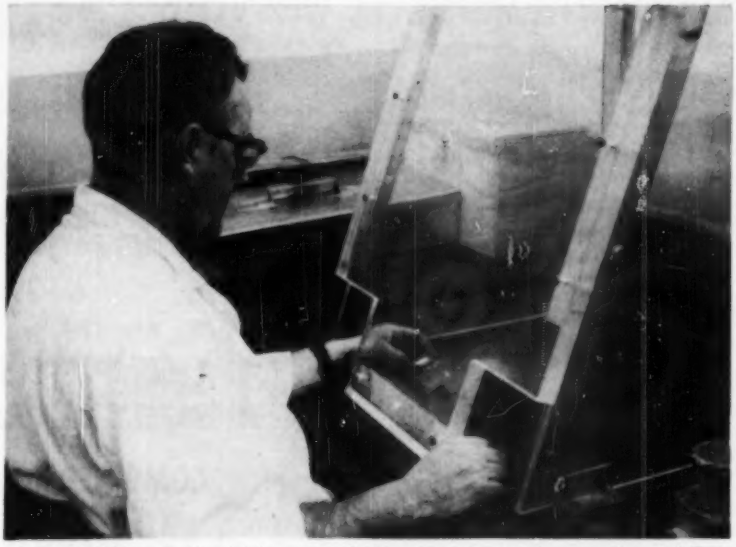

Protected by a lucite shield, an explosives operator in the Experimental Fuse Unit of Picatinny Arsenal prepares to remove a low-energy detonator from an assembly. "Wristlet" on left arm and tools are grounded to drain off any static electricity. Assemblies are kept in grounded metal box in background.

NIGHTMARE HAZARDS: Explosions Caused by Passing Cars or Combing One's Hair

Technicians in the Experimental Fuze Unit of the Arsenal Operations Division at Picatinny Arsenal, Dover, New Jersey, work with hazards they cannot see—low-energy initiators which can be detonated by small electrical currents.

The low-energy explosives are so sensitive to electromagnetic fields that they may be detonated by impulses from the generator of a passing car or even the static electricity created by a person combing his hair.

Safety experts have undertaken an elaborate safety program which greatly reduces the possibility of an accidental detonation. The entire laboratory is shielded with galvanized steel mesh to prevent penetration by stray radio waves. The floor is made of a special conductive rubber, grounded to drain off static electricity. All machinery and tools are grounded.

All light switches and bulb sockets are specially-designed explosion-proof fixtures. Even telephones are designed to prevent emanation of electric waves.

The clothing of all workers is carefully monitored. Only conductive-soled shoes and cotton clothing are worn, since regular-soled shoes prevent drainage of static electricity, and clothing of synthetic materials tends to create static electricity. Chemically-treated flame-resistant uniforms with no pockets or cuffs which would collect explosive dust are provided. Jewelry and combs are prohibited.

The footwear of persons entering the building are "checked" by an electronic detector to determine their conductivity. Workers shower and change uniforms to remove explosive dust before leaving the Arsenal.

When the explosive items are removed from their protective aluminum foil wrappings to be packed into casings, technicians don metal "wristlets" to which ground wires are attached. Operators handle the explosives behind transparent lucite barriers with only their hands and forearms extending around the shield. When a shield cannot be used, goggles, face masks and special uniforms are worn.

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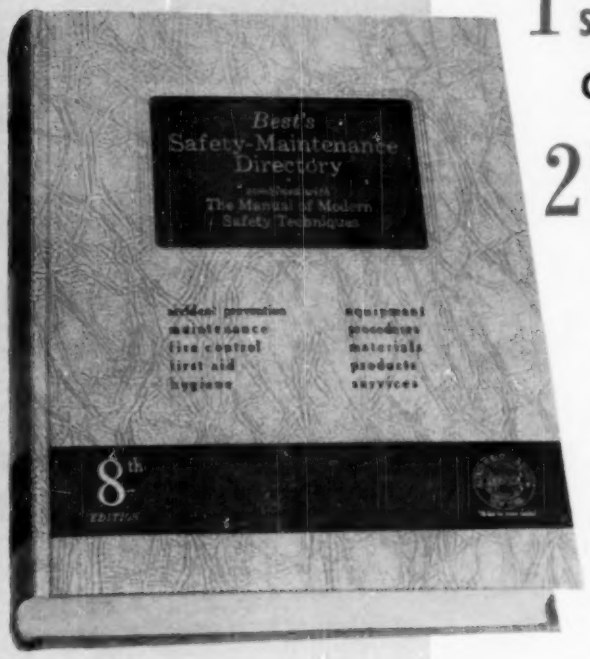

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Safety Congress
(from page 19)

chanic produces a sharp cutting tool he must possess and apply many skills. Likewise, our modern-day supervisor must possess many skills in order to coordinate his equipment, materials, and people."

Mr. VanNamee enumerated the yardsticks which can be applied to measure the degree of success that is being achieved in any safety training undertaking. He listed the more important ones as:

1. Improvement in the safety attitude and accident experience of employees in departments of supervisors that have received safety training.
2. Quality accident investigation reports that reveal that positive action has been taken.
3. Sustained acceptance of accident prevention responsibility by trained supervisors.
4. Voluntary development of safe methods and procedures.

Users of power lawn mowers and home workshop tools need eye protection as much as factory workers.

"Industrial-type hazards to vision have jumped the fence," said James E. O'Neil, director of industrial service, National Society for the Prevention of Blindness, New York City, "and are now widespread throughout the community."

O'Neil said that more than 9 out of 10 of the 1,000 industrial eye injuries each working day are "needless and preventable."

"Eye injuries can't be stopped by gazing into a crystal ball and trying to guess which worker might get hit in the eye," he declared.

"Gate-to-gate eye protection is the only proved and economically sound method of freeing workplaces of the threat of blindness."

O'Neil said nearly 20,000 persons have been awarded lifetime membership in the Wise Owl Club for saving their sight by wearing eye protective equipment.

"I regard this as proof positive that safety eyewear will do the job if it is worn," he said.

"For some reason," he said, "the schools of this nation permit students to face industrial type hazards without adequate personal protection, such as goggles. As a result, students are having their vision needlessly injured or destroyed."

You're wrong if you picture arctic explorers as the reckless, devil-may-care type.

"Arctic safety," R. F. Shaw, executive vice president of the Foundation Company of Canada, Toronto, told his hearers, "requires such careful planning that bravado must be unnecessary."

Shaw destroyed some other common misconceptions about working in cold areas. For example:

On wearing beards—"Beards are not a recommended article of wearing apparel. They are hard to keep clean and dry—and they're definitely not comfortable."

On wearing heavy clothing—"I left home dressed in the latest arctic gear. I went from my heated home to a heated car to a heated aircraft to a heated snowmobile. For two solid weeks I was overheated! If my jeep had suddenly been lost and stalled, I soon would have felt the cold through my moisture-laden clothing."

On keeping warm with alcohol—"Alcohol lowers the body temperature. What it does to abilities is well known. The best rule for the North is no alcohol!"

On danger of fires—While most people probably assume there's little fire danger in the arctic, what with all that snow around, "there is no disaster more dreaded in the North than fire," according to Shaw. "Arctic fire is hard to fight because there is no water, and pipes freeze whether above or below ground."

Labor-management cooperation is vital to the safety of Americans in the air—and to labor and management themselves.

A top union official, Clarence N. Sayen, president of the Air Line Pilots Assn., told the convention, "High levels of safety are necessary to secure and hold the confidence of the traveling public. Without such confidence, the airline industry cannot survive, and the welfare of both labor and management is affected.

"The pilot has a statutory and practical responsibility for safety which he cannot delegate to his employer, the government or anyone.

"Labor-management cooperation in the field of air safety," he concluded, "is not a luxury, but a necessity."

The best incentive to a good safety program is interest and action in safety by management—not prizes, cash or merchandise awards.

Robert M. Gilmore, general safety supervisor of Rayonier, Inc., Hoquiam, Wash., said he is "unqualifiedly opposed to the giveaway approach to safety where an attempt is made to 'buy' safe performance through use of various prizes, cash or merchandise awards."

ASA Staff Engineer For Safety Standards

The appointment of Lawrence A. Carvey of Glendale, N.Y., to the position of staff engineer—safety standards—of the American Standards Association has been announced by Vice Admiral George F. Hussey, Jr., managing director.

"The ever-increasing number of important projects in the safety, highway traffic and nuclear fields made this addition to our staff necessary," explained Admiral Hussey. Mr. Carvey will assist Henry G. Lamb, safety engineer.

Mr. Carvey was formerly employed by Continental Casualty Company, and later by General Fire & Casualty Company, where he was in charge of safety engineering and applied accident prevention.

Born in Brooklyn, New York, Mr. Carvey attended Cooper Union School of Engineering and the New York University Center for Safety Education. He is a member of the National Safety Council, Veterans of Safety, and recent past president of Safety Center Alumni of N.Y.U.

The American Standards Association is the national clearinghouse and coordinating body for voluntary standardization in the United States. It is a federation of 122 trade associations, technical and professional societies, and consumer groups. More than 2,000 companies are members.

"Such programs," he asserted, "can have no real, lasting effect in creating a safe work force. The emphasis is solely on achievement of a record, and not on the fundamentals of an effective safety program.

"Safety should be treated as a regular part of the job, and something workers are proud of."

"The best incentive to safety is a well-organized program carried on continuously as part of good operating procedures, and administered by safety-minded supervisory personnel," he declared.

Off-the-Job Safety

Off-the-job accidents have a greater impact on both the profit and humanitarian aspects of American business than industrial accidents.

Robert S. Stevenson, president, Allis-Chalmers Manufacturing Co., Milwaukee, Wisc., said "Tremendous strides have been made in reducing our industrial accident rate. We're at a point where we can tell our employees that they're safer at work than they are at home . . . but we can't tell them to prolong their lives by working a 24-hour day," he said.

Speaking before the 22nd Annual Safety Meeting for client companies of Ebasco Services, Inc., nationwide management consulting, engineering and construction firm, he stated, "The National Safety Council figures the cost of off-the-job accidents as $49 per person per year, a cost that must be shared by employees and employers."

Management is responsible for the safety of its employees, Stevenson maintained, and when safety has good management it contributes directly to the profit column. The very orderliness and organization which helps a plant run safely will also help that plant run smoothly and efficiently, he added.

"Although safety has a direct bearing on the dollars and cents operations of a company, the humanitarian factor also contributes to the management awareness of this problem," Stevenson said.

"Safety is more than good business in the operating sense. Safety is a personal, moral obligation for each of us, as individuals and as members of management. None of us can ignore the opportunity to exert our influence in our companies' operations, in our homes, and in our communities to reduce or eliminate pain and suffering in our fellow humans."

Another Injury Checked

Safety Shoe Saves Toes

Cyril Miller, a hand trucker, with B. F. Goodrich Footwear and Flooring Company, Watertown, Massachusetts recently prevented injury to the toes of his right foot by wearing safety shoes.

The employee was riding up an elevator that had a St. Louis door at each landing. There was a small space to stand between a truck of aluminum lasts and the door. He was facing the elevator door, and as he approached the third floor, his right foot projected out beyond the elevator floor and became jammed under the lower half of the door. The leather was torn off his steel toe cap, but his toes were saved. Application for Miller's membership in the "Golden Shoe Club" has been requested by William J. Dooling, Supvr. of Fire and Safety.

Does mowing your ever-growing lawn get your goat? Then get a goat!

That was the advice given by a Baltimore, Md., safety engineer at the National Safety Congress. Walter J. Chuprun, safety engineer with the Baltimore Urban Renewal and Housing Agency, pointed out that goats not only are self-starting and self-finishing, but that they're also a lot less hazardous than their modern-day counterpart—the power lawn mower.

Assuming, apparently, that most suburbanites will prefer the power lawn mower to the goat for grass cutting, Chuprun gave these suggestions on how to stay safe while using a mower:

1. First, read the instructions.
2. Never allow inexperienced persons to operate a mower.
3. Don't leave a mower unattended, especially if youngsters are around.
4. Don't make any repairs without turning off the mower and disconnecting the spark plug wire.

"Lawn cutting can be easy, safe and a pleasure," said Chuprun. "It all depends on you."

Courtesy and common sense . . . those are the keys to safety on the nation's waterways.

Capt. C. H. Broach, chief of the Coast Guard's merchant vessel in-

(Continued on page 26)

MOPS: Their and

Fig. 1 Allow 12 hours between treatment of dust-mop and use. Rolled up in metal container, dust-mop is fully permeated.

Fig. 2 To clean dust-mop, use vacuum cleaner, if possible. Shaking leaves mop half clean. Vacuum does a thorough job.

by **EDWIN B. FELDMAN**
Vice President—Engineering
Puritan Chemical Company

You may think of mops as a minor part of the maintenance job in your plant or building—but are they? It can be well worth your while to take another look at the way your custodians use and care for such simple housekeeping tools as mops.

Though housekeeping has been mechanized to a great extent, the wet mop and the dust mop are still the tools that your custodians use most—every day, in fact. When mops are used according to engineered methods, you get cleaner floors, the mops themselves last much longer, and custodians' work is easier and safer.

Engineering Studies

Extensive engineering studies of industrial housekeeping have been made in recent years. We now know much more about how to select the proper equipment, how to get the best results with the least wear on the equipment itself, and how to train custodians in labor-saving methods of using equipment. Since labor generally accounts for 90 percent or more of the housekeeping cost in industry and institutions today, engineered work methods can save thousands of dollars in time and labor, while getting better results from the work done.

If you were training a young carpenter, you would first teach him to select the right tools, to use them correctly and safely, and to take good care of them. Train your

SELECTION, USE AND CARE OF DUST MOPS

SELECTION

1. Select the proper size mop for the job to be done. Use as large a mop as the space of the area to be cleaned will permit (The 24" size is most often used).
2. Although the rigid frame rectangular dust mop is used for most situations, use the swivel-head type of dust mop when it is necessary to mop under and around areas congested with furniture.
3. Cotton dust mops are usually superior to Saran or other similar fibres for general, continual use. Although the Saran mop is factory treated, once it is used and washed, it looses its dust gathering ability and cannot be easily retreated.
4. Be sure that the mop block or frame is of the proper size for the mop head.

USE

1. Do not use a dust mop on wet or oily floors.
2. While mopping, keep the back as straight as possible and bend at the hips. Do not over-reach. Following these rules of work posture will reduce fatigue and prevent strain.
3. Do not lift the mop from the floor unnecessarily, some of the gathered soil may drop from it.
4. Do not bear down on the mop, pressure is not necessary to proper mopping action.
5. If a vacuum is available, utilize it to remove loose soil from the mop frequently. If no vacuum is available, the mop head should be frequently shaken into a large waste receptacle or a dust box to remove and collect loose surface soil. (See Figure 2.)

CARE

1. *IMPORTANT:* Soiled dust mops (also dust mitts and wiping cloths) should be collected at the end of each working shift and properly treated:
   a. Shake out the mop carefully into a waste receptacle, dust

(Continued on page 27)

Engineer Use Care

FLOOR MAINTENANCE SERIES
Other Articles Nov. & Jan.

Fig. 3 Mop squeezers, rather than roll-type wringers, are advised for removing excess water. They prolong mop life.

Fig. 4 For the prevention of back strain and reduction of fatigue while mopping, keep the back straight, bend from hips.

custodians the same way. A well-trained custodian who has a good attitude toward the care and use of his tools will have the same attitude toward caring for your plant or building.

A good place to start custodial training is in the basic use and care of wet mops and dust mops. The two accompanying data guides present some recommendations that have been developed as a result of engineered maintenance studies. When these procedures become regular work habits, they make mopping an easier task and a more effective one. Better still, they can change mopping from a commonplace chore to an organized preventive maintenance activity—the effect on your custodians can be remarkable.

Easy Training

The suggestions in these accompanying guides are easy to follow. More importantly, they are simple to **teach.** Maintenance foremen will find it worthwhile to hold special training sessions to teach custodians these basic rules. The sessions should be followed up by close supervision until these rules become regular work habits. By applying these engineered maintenance methods you can expect these results: **improved maintenance, fewer strains and sprains among workers, and long-range dollar savings.**

Pictures by courtesy of Puritan Chemical Co.

SELECTION, USE AND CARE OF WET MOPS

SELECTION

1. **Select the proper size mop for the job to be done. Use as large a mop as can be handled regularly by the user without undue fatigue and as the space permits. (The 24 oz. mop is most often used.)**
2. **Metal mop sticks with removable mop heads provide these advantages:**
   a. **The entire mop head is in use (about ⅓ of the mop on a wooden stick cannot be used because of the method by which it is fastened).**
   b. **The removable mop head is more easily cleaned and dried.**
   c. **The removable mop head limits the entrapment of soil and other particles.**
   d. **The mop lies flatter on the floor, covering a larger area, and is more easily turned from one side to the other.**
   e. **Steel mop handles do not warp or splinter, and are easier to keep clean.**
3. **Blotter (rayon) mops have the advantage over cotton of being lighter, much more absorbent, more easily rinsed, and require less effort and time for a job.**
4. **Cotton mops are superior to rayon mops for applying water emulsion wax.**

USE

1. **The basic purpose of the wet mop is to transfer liquid to and from floors. The use of mops for other purposes should be discouraged.**
2. **Soak a new mop in warm water for at least 20 minutes before use, in order to remove excess oils and expel entrapped air, providing better absorbency.**
3. ***IMPORTANT:* Change mopping water frequently while mopping to prevent the water from becoming overly dirty. Rinse the mop each time the water is changed. Dirty water will cause a re-deposit of soil during mopping, leaving soil streaks.**
4. **While mopping, the mop should stay on the floor, and should not be flung about.**
5. **The mop should be turned from one side to the other frequently**

(Continued on next page)

SELECTION, USE AND CARE OF WET MOPS

(from page 25)

while in use in order to expose more clean, moist strands.

6. **Wherever possible the use of mop squeezers are recommended over roll-type wringers. The squeezer is more efficient in the removal of moisture from the mop and is far less destructive to the mop. Mops should be squeezed or pressed carefully to remove water; twisting the mop will tear or weaken the strands. (See Figure 3.)**
7. **Mops can be used for scrubbing small areas and spots by folding the mop over on itself so that the tips of the strands are in direct contact with the floor, under pressure. Never scrub with the part of the mop closest to the holder because this will tear the strands.**
8. **Avoid the use of mops with lye, caustics, or strong undiluted cleaning solutions because these materials attack the mop strands.**
9. **If a rough surface is to be mopped (such as splintered wood), mop very carefully and try to mop in a direction which will avoid snagging. It is best to reserve a special mop for use on such a surface.**
10. **It is not economical to continue to use worn-out mops—they should be discarded.**

CARE

1. ***Always* rinse a mop carefully after use and squeeze it dry.**
2. **Mops should be stored in a warm dry area where air circulates freely.**
3. **A mop in storage should be hung with the yarn away from the wall, strands down.**
4. **Do not let wet mops touch each other, other equipment, or come in contact with walls.**
5. **If mop strands become loosened, they should be removed or cut off with a scissors in order to prevent snagging and splattering.**
6. ***IMPORTANT:* In addition to rinsing the mop whenever the mopping water is changed, the mop should be carefully washed periodically (daily if possible). The frequency of washing will depend upon the use to which the mop is put, but mops in regular use should be washed carefully at least weekly, preferably before the week-end. Where a number of mops are in regular use it is practical to use a mop washing machine which exposes the mop to a high-pressure clear water bath.**

Safety Congress

(from page 23)

spection division, told delegates that about eight million pleasure crafts are afloat today.

"Recreational boating is big!" he declared. "And boating safety is everyone's business."

Some of the many persons responsible for boating safety, according to Capt. Broach:

1. Boat manufactureres and dealers. "They have serious responsibilities for safe boating. This responsibility is mainly a moral one, but it is very strong."

2. Boat liveries. "Renting boats obviously too small for the load, or with too low transoms for the size motors being used, is common. But the major violation of both law and common sense is renting boats without life preservers or other life-saving equipment."

3. The boat owner himself. "He should learn the rules of the road—the traffic rules for driving on the water. He should learn how to use and take care of his safety equipment, and should recognize the need for laws and cooperate in their enforcement."

Main cause of unsafe boating?

"Lack of knowledge of elementary safe boating procedures," said Capt. Broach.

What makes a safe worker in industry?

Usually, safety-conscious parents, declared J. O. Musick, general manager of the Texas Safety Assn., Austin, Tex. He told delegates that the safest workers "come from homes where the parents themselves have had the benefit of safety training—on the job, at PTA's, in first-aid classes or as members of organized safety groups."

"Happily," he said, "parents are becoming more and more safety conscious.

"But safety education in the home—even under the best conditions—is likely to be haphazard and punctuated with unintentionally poor examples by the parents," said Musick. "Therefore, the real burden of safety education rests with the schools—from the first grade through college."

Schools which teach safety education actually are doing their students a favor, Musick pointed out.

He said industry, for example, often thinks twice before hiring a person with a poor safety attitude.

One out of three fire victims under 14 years of age died in 1959 because he was left alone and unattended by his parents, or because he was left in the care of a baby sitter unable to cope with a fire situation.

That fact was reported by Jules V. Quint, supervisor of occupational and accident statistics for Metropolitan Life Insurance Co., New York City.

Until somebody discovers a device to spell an end to home fires, Quint said, "the prevention of death and injury from accidental burns, fires and explosions in the home will remain a grave obligation confronting the entire community."

Quint said more than 5,700 deaths occur annually in the United States from burns, fires and explosions in and about the home, and that a recent study showed 929,000 persons suffered burns in the home in one year. Only burns counted were those serious enough to cause the victims at least a day of restricted activity, or those requiring medical attention.

He cited these facts about home fires and burns:

1. The highest death rates occur

in the South and Southwest, probably because of the type of housing. Most fires in an Arkansas county involved misuse of petroleum products.

2. Fire prevention is a year-round job, since deaths from fires occur on an average of 10 a day in summer, about 30 a day in winter.

3. Chief victims of home fires, burns and explosions are the young and the old.

Highway Safety

Behind delinquent drivers often are delinquent parents.

"Parents take the path of least resistance," declared John T. Haack, coordinator of safety education, Davenport public schools. "They would rather put a meance on the highway than keep a nuisance at home."

Haack, general chairman of the National Safety Council's driver education section, said to solve the the nation's traffic accident problem, "we are going to have a new crop of drivers—more skilled, better informed and with an improved code of social, moral and personal responsibilities."

"We must either educate all the youth to drive, or take them off the highway," he declared. "I'm sure we don't want the latter, so it means educate them to drive—and to live."

What will things be like out there on the highway in another 10 years?

Will there be room to park your car, much less to drive it?

How fast will you drive? And what about the traffic toll?

Here's the way an official of the National Safety Council sees it:

A merry little swarm of 100 million cars, trucks, buses and what-not will throng the highways in 1970—half again as many as are out there now!

They will be driven a trillion miles a year by 120 million drivers.

If placed end to end, they would form a solid line of traffic 385,400 miles long—15 times the distance around the world and equivalent to a traffic jam along U. S. 66, for example, of 190 cars abreast every foot of the way from Chicago to Los Angeles.

That was the traffic picture in the next decade painted by Paul Jones, of Chicago, director of public information for the National Safety Council.

"And what is the price in human life and in cold cash that we may have to pay for all this?" Jones asked delegates at a Commercial Vehicle session.

"Well, unless we do better in the next 10 years than we are doing now, there will be a traffic toll in 1970 of 55,000 deaths and two million disabling injuries. And the cost will be about nine billion dollars!

"It is obvious, therefore, that the traffic situation is one of the great unsolved social problems of our time. And either we go a long way toward solving it in the next 10 years or we had better take to the hills in self-defense!"

Jones praised the motor transport industry for its steady reduction in accident frequency rates during the last decade.

"This achievement," he said, "has been inspiring to everyone concerned with traffic safety. It is definite proof that highway accidents can be prevented if a real effort is made to prevent them."

Jones pointed out that payola, rigging and the fix that seem to prevail in many areas of modern life have invaded the safety field, impeding efforts to reduce the traffic toll.

"More and more," he commented, "it seems to be the sophisticated procedure to clip a $5 bill to your driver's license when you are stopped by a traffic officer."

"More and more it seems to be a point of pride for the head of the family to brag to his children that he outsmarted a traffic officer who stopped him for speeding. And then he wonders why youngsters grow up with no respect for the law!

"More and more it seems to be a mark of erudition and casual living to have 'one for the road.'

"It is amazing and distressing that so many people try so earnestly to beat the laws that were made for their protection."

(Continued on page 58)

SELECTION, USE AND CARE OF DUST MOPS

(from page 24)

bin, or in an area where the soil will not spread.

- **b. Remove splinters or other foreign materials from the mop strands.**
- **c. Spray on a dust mop treating compound according to manufacturer's instructions. Be careful not to overtreat the mop head. (See Figure 1.)**
- **d. Roll up the mop head snugly and place in a closed metal container reserved for this purpose.**
- **e. Allow at least 12 hours for the mop treatment to permeate the strands before re-using.**

2. ***IMPORTANT:* Launder the mop when it becomes soiled:**
   - **a. Place in a netted bag, or bind the strands in two places, to prevent tangling while the mop is being washed.**
   - **b. Wash in a solution of warm water and a detergent.**
   - **c. Dry the mop head carefully.**
   - **d. Comb the strands.**
   - **e. Treat the mop head with a treating compound (See #1-c, d, e).**
3. **Mops should be stored in a clean, dry area. Hang the mop so that it does not touch the walls and equipment and will not be brushed against by personnel. Mops should be hung with the mop heads down.**
4. **Keep the tie cords in proper repair and in place.**
5. **Do not allow the strands to become knotted or matted. Keep the strands free from splinters, metal particles, and keep them combed regularly.**
6. **When shaking out a mop, do not strike the handle or any part of the mop against a hard surface. Such action might damage the frame and weaken the handle.**

Achievements and Awards

The Naval Ordnance Laboratory at White Oak, Maryland, has been awarded the Secretary of Navy's Industrial Safety Award for the ninth time. In its class, NOL has a safety record second to none.

The award is presented annually to the Bureau of Naval Weapons activity employing over 1500 persons which has the lowest accident rate. Some 45 activities throughout the United States and overseas are included in this category.

Comparing NOL's safety record with that of other Bureau activities in its class, the Laboratory has a cumulative frequency rate of 0.86 injuries per million man-hours as compared to the average of 2.02 for the Bureau. In comparing severity rates, NOL had a cumulative severity rate of 36 days lost per million man-hours while the Bureau average is 134.

George S. Ennis, NOL Safety Officer, accepted the award from Capt. W. D. Coleman, NOL Commander who made the presentation on behalf of Admiral W. K. Mendenhall, Jr., Commandant of the Potomac River Naval Command.

• • •

Sixty-three employees of The Chesapeake Corporation of Virginia have been cited by Erik Zimmerman, vice president and production manager, for having worked with a perfect record of no disabling injuries. Fifty-three are employed in the General Yard, seven in the Storeroom, and three in the Safety Department.

The General Yard had its last disabling injury in 1955. Since then, it has completed five years or 70,000 man-days without such an injury. The Storeroom has not had a disabling injury since 1946, when uniform statistics on injuries were first kept from year to year in the plant, and there is no record of a disabling injury for the Safety Department. The Safety Department was established in 1950, when the present safety program was begun. In 1957 the entire plant had no disabling injuries, and the company was given the Award of Honor by the National Safety Council.

• • •

An industrial safety record of 420 days without a disabling accident was reported by James H. Tucker, plant manager of the Pratt, Read & Co. action division, which was moved to Central, S. C., in the fall of 1958.

"This achievement is a tribute to our work force, who, in two short years have mastered intricate machine procedures with such skill that a record of unmatched safety was attained," Mr. Tucker said.

• • •

The Granite City, Ill., plant of the A. O. Smith Corporation recently established a new safety record of 1,500,000 man-hours worked without a disabling accident. Safety Director for the plant, which manufactures automobile frames, is C. E. Blankenship.

• • •

Can Manufacturers Institute was cited for excellence recently by the National Safety Council for a record breaking 7th consecutive year. The occasion marks the first time that any association has qualified for the council's safety award this number of times. Specifically, the association was commended for the "... excellence and balance in their safety program which resulted in reducing injury frequency more than 66 percent during a 10-year period."

Behind the award lies the concentrated effort on the part of Can Manufacturers Institute's Safety Committee, instituted in 1952 in an attempt to help reduce can makers' injury incidence rate. The accident frequency rate has been reduced from 14.9 disabling injuries per million man-hours worked in 1950 to 5.27 at present.

CMI's Safety Committee is composed of representatives of industrial hygiene departments in the 46 member companies of the association. In all, those participating in competition for the Safety Council's award represent 210 plants and approximately 62,000 workers. This broad participation assures that the best safety practices and policies are exchanged within the entire can making industry. Members make known their mutual work hazards, their frequency, and attempt to eliminate them by mutual action. Communications of all kinds, posters, safety reports, mailings, surveys, etc. are used to inform production-line personnel of committee findings.

• • •

Watervliet (N. Y.) Arsenal recently became the first arsenal and the third US Ordnance Corps installation in history to receive the National Safety Council Award of Honor for its record of three million man-hours worked without a disabling injury.

In presenting the award plaque, Rep. O'Brien (30th Cong. Dist.) praised the Arsenal's safety record as an achievement possible only in

an establishment maintaining the highest standards of work efficiency. He complimented Col. Tisdale and Safety Director Frank J. McGinnis on their conduct of the Arsenal safety program.

Col. Tisdale, commending Arsenal personnel, said that the outstanding safety record was proof that hazardous work can be performed efficiently without injury. He urged continuous emphasis on safety, pointing out that on Dec. 7th, the Arsenal would complete an entire work-year without a disabling injury.

The special ceremony also included presentation of awards to eight organizational units which have exceeded requirements of the Arsenal Safety Awards program. Certificates of Merit for completion of one year without a lost-time injury were presented to Supply Section and Tubes Section. Sustained Safety Performance plaques marking three years without a lost-time injury went to National Industrial Division, Major Components Section and Metal Processing Section. Outstanding Safety Performance plaques indicative of a million accident-free man-hours were awarded to Research & Engineering Division, Tools Section and Manufacturing Branch.

• • •

In recognition of an outstanding safety record of one million man-hours without a disabling injury, Read Standard Division of Capitol Products Corp., York, Pa., manufacturer of bakery, food and chemical processing equipment, received an award of merit in the form of an engraved plaque. The plaque was presented by Harper Smith, senior safety engineer for the Liberty Mutual Insurance Co., to N. H. Whisler, Read Standard director of manufacturing. Period covered by the million man-hours was from July 25, 1959, to May 9, 1960.

"Full credit for this remarkable achievement should go to the shop members of our plant and safety committee," said Milton C. Brune, plant engineer and chairman of the safety committee. "Personal contact was the secret of making everybody safety conscious. If a man would forget, say, to wear his

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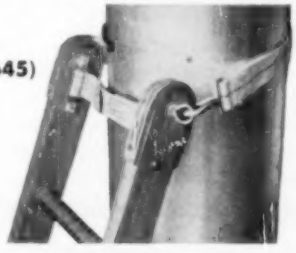

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safety goggles, some member of the committee would tap him on the shoulder and tell him, 'Buddy, that's not the way we do things.' This informal policing by fellow workers really has made us think, act and live safety here."

• • •

Three more major Atomic Energy Commission plants have exceeded 10,000,000 man hours of operation without a disabling accident to personnel, thus reflecting a continued level of performance which compares favorably with that of the nation's safest industries.

Latest unit to reach the 10,000,000 man-hour mark in a safety competition among AEC-contractor installations is the AEC's Y-12 plant which is operated for the Commission at Oak Ridge, Tennessee, by the Union Carbide Corporation.

The two other plants which have passed the 10,000,000 man-hour safety mark are the AEC-owned Hanford Works at Richland, Washington, operated by the General Electric Co., and the AEC-owned Rocky Flats plant at Boulder, Colorado, operated by the Dow Chemical Co.

Safety performance marks by AEC-contractor plants and installations involve not only prevention of the usual types of industrial accidents but prevention of radiation injury to personnel as well.

The all-time AEC-contractor safety record is held by the Sandia Corporation which operates Sandia Laboratory in Albuquerque, New Mexico, a branch laboratory at Livermore, California, and various field test facilities for the Commission.

As of September 6, 1960, Sandia Corporation had established a new safety record of 14,936,169 man-hours. The Sandia total, which began accumulating on July 12, 1959, ended on September 6 when a lost-time injury occurred among its 7,099 employees.

Other AEC-contractor plants which have exceeded five million man-hours worked without lost-time accidents include those operated by: General Electric Co., Lockland, Ohio, former record holder with 11,175,509 man-hours; E. I. du Pont de Nemours & Co., Aiken, S. C., 7,538,477; Westinghouse Corporation, Atomic Power Division, Pittsburgh, Pennsylvania, 5,302,910; Argonne National Laboratory, Lemont, Illinois, 5,171,481; and Phillips Petroleum Co., Idaho Falls, Idaho, 5,000,000.

• • •

Benson Ford recently gave recognition to three Detroit-area facilities of Ford Motor Company for setting world safety records in their fields in recent months. He presented safety citation plaques honoring employees of the Detroit Parts Depot, Power and Utility Services and the Marine Services.

Mr. Ford, said that unlike many aspects of a corporation's business, safety never can be reduced to a statistic. The real significance of safety programs, he said, is that they protect the health and lives of human beings. He added:

"A statistician can tell us how much we save by encouraging the highest safety standards. A lawyer can tell us how much we save in workmen's compensation costs. A doctor can tell us our saving in purely physical and medical terms. But none of these men can give us the saving in human health and happiness.

"This, it seems to me, is the real meaning of safety, in Ford Motor Company and elsewhere."

Employees at the Detroit Parts Depot on Telegraph Road set their record in the warehousing industry by working 3,467,368 man-hours without a disabling accident.

Employees of the Power and Utility Services in the Rouge area established their record for the steam heat and power industry by working 2,297,659 man-hours without a disabling accident.

The company's Great Lakes Marine Service employees worked 729,209 man-hours without a disabling accident for the record in the tanker and cargo vessels industry.

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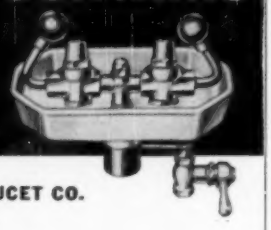

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Industrial Hygiene Foundation Celebrates 25th Anniversay

Industrial Hygiene Foundation observed its silver anniversary of progress in safeguarding industrial health, on the occasion of its 25th annual meeting at Mellon Institute, October 26 and 27.

Established at the Institute in 1935, the nonprofit Foundation now has some 400 member organizations among companies and industrial associations throughout the nation. More than 500 officials of these groups gathered at the meeting to hear discussions by experts in industry, insurance, government, law, medicine, and science.

The latest developments in several major problems were reported by a battery of authorities at the all-day Management Conference on October 26.

"Group Insurance—A Mounting Production Cost," the topic for the morning, was discussed by three speakers, E. T. Klassen, American Can Co., New York City; R. R. Shinn, Metropolitan Life Insurance Co., New York City; and Dr. J. F. McCahan, Western Electric Co., Chicago. Elimination of abuses and establishment of better controls were advocated as ways to reduce the increasingly higher costs of group insurance and employee health care, considered a serious financial problem in business and industry.

One of the most troublesome problems facing the public and the consumer-chemicals industry was discussed at another session, "Effects of Food Additives Legislation on Food Technology." The three speakers were: K. E. Mulford, Atlas Power Company, Wilmington, Delaware; L. A. Coleman, Allied Chemical Corp., New York City; and D. B. Hand, Cornell University.

Another topic was "Standards for Air Quality," a discussion of trends in municipal air-pollution legislation. The speaker, V. G. MacKenzie, Chief, Division of Air Pollution, U. S. Public Health Service, is in the position of being a coordinator for the government on air-quality standards. The questions of whether such standards are needed, whether they can be set up, and whether they are practical were considered. Current efforts of the city of Los Angeles to establish standards, if successful, could have a profound effect upon other cities and states.

The Joint Medical-Legal Conference took the form of a panel discussion. "Emphysema, Pneumoconioses, and Compensation" was the subject of this important forum on the problem of dust pulmonary diseases which still persist despite medical advances.

A panel discussion on "Methods of Measuring Work Capabilities of the Individual" was the major part of the Medical Conference. Dr. L. W. Gregg, Carnegie Institute of Technology, discussed the prediction of human tolerance to stresses of specific jobs. Factors such as high blood pressure and emotional stability were considered in stresses such as those experienced by the astronaut, the worker in a hot steel mill, and the white-collar employee. A related talk dealing with a unique procedure was presented by Dr. H. S. Belding, Graduate School of Public Health, University of Pittsburgh. Dr. Belding described instrumentation that makes possible remote monitoring of a worker's physical and psychological strains, without interfering with the worker's activity.

Aspects of workmen's compensation constitute the entire program of the Legal Conference. An important discussion of safety was presented by Andrew Kalmykow of the Association of Casualty and Surety Companies, New York City. A second talk, by H. F. McNiece, St. John's University School of Law, dealt with the legal basis for awards that have been made in specific cardiac cases. Emphasis was given to cases involving attacks based on mental strain.

A highlight of the Engineering Conference was a discussion of the expansion of city zoning regulations to control industrial plant locations from the standpoints of dust, smoke, noise, vibration, illumination nuisance, and toxic-matter emission. The talk was presented by W. T. Ingram, ASCE. Other topics included toxicity labels on containers for chemicals used by chemists and industrial workers as well as the public; coded symbols for hazards such as radiation; and safety problems created by new scientific developments such as plasma jet and the fuel cell.

"Chemical Antidotes for Radiation Injury" were discussed by Dr. John Doull, USAF Radiation Laboratory, University of Chicago, at the Chemical-Toxicological Conference. Dr. Doull emphasized the necessity for awareness of hazards in the development of new rocket fuels "from test-tube to launching pad."

A REVIEW OF DUST

by **DAVID G. STEPHAN**
Senior Sanitary Engineer
U. S. Public Health Service
Engineering Research & Development Unit
Air Pollution Engineering Research
Robert A Taft Sanitary Engineering Center
Cincinnati, Ohio

A useful outline of the and fume collectors which commercially — where to advantages, limitations

Dust collectors have been utilized for many years as standard equipment on a number of operations. In the foundry industry, for example, rare is the case in which casting cleaning, shake-out, or grinding operations do not have a dust collector of some type as an integral part of the process. Familiarity with this equipment gives an excellent background for understanding the principles, advantages, and limitations of the various types of dust collection equipment, an asset which may well lead to direct financial savings, as the need for expanded dust control activity increases over the coming years. This need is already apparent in a number of localities, but with the growing public awareness of air pollution, control ordinances requiring more comprehensive and more efficient dust and fume elimination are a virtual certainty during the '60's.

To begin with, let us recognize that there are a number of reasons for using collection equipment. Obviously collectors are, in many cases, simply a component of a process, without which the process could not operate. Examples are the collection of material being pneumatically conveyed, the collection of a product such as zinc oxide, carbon black, or dehydrated milk, or the recovery of reusable materials such as nonferrous grinding dusts. In other cases, collectors are used: to reduce equipment maintenance (the oil bath air cleaner on a car); to improve product quality (the

TABLE 1:
Factors in Selection of Dust Collecting Equipment

1. Particulate characteristics
   a. Particle-size distribution. Particle diameters are usually given in microns (1 micron = 1/25,400 in.).
   b. Particle shape
   c. Particle density
   d. Physico-chemical properties
      1) Hygroscopicity
      2) Agglomerating tendency
      3) Corrosiveness
      4) "Stickiness"
      5) Flowability
      6) Electrical conductivity
      7) Flammability
      8) Toxicity
2. Carrier gas characteristics
   a. Temperature
   b. Pressure
   c. Physical properties
      1) Humidity
      2) Density
      3) Viscosity
      4) Electrical conductivity
   d. Chemical properties
      1) Corrosiveness
      2) Flammability
      3) Toxicity
3. Process factors
   a. Volumetric flow rate
   b. Constancy or variability of gas flow
   c. Particulate concentration, usually given in grains per cu. ft. (1 grain = 1/7000 lb.).
   d. Allowable pressure drop
   e. Product quality requirements
   f. Required collection efficiency. The requirement may be based upon:
      1) Value of material being collected.
      2) Nuisance or damage potential of the material.
      3) Physical location of the exhaust.
      4) Geographical location, i.e., air pollution susceptibility of the area.
      5) Applicable code or ordinances (consider anticipated future legislation).
4. Operational factors
   a. Ease of maintenance
   b. Need for continuity of operation
5. Constructional factors
   a. Available floorspace
   b. Headroom limitations
   c. Material limitations imposed by temperature, pressure, or corrosiveness of exhaust stream.
6. Economic factors
   a. Installation cost
   b. Operating cost
   c. Maintenance cost

COLLECTION EQUIPMENT

types of dust
are available
use them, their

cleaning of ventilation air to a photographic film manufacturing area); or to prevent physical damage to the plant or equipment (removal of acid mists or collection of fumes causing damage to automobile finishes). Each of these instances presents some measure of positive economic justification for installing and using control equipment. Also, there are applications necessary because of either moral or legal considerations. Here are included the eradication of safety or health hazards (the collection of siliceous particulates or combustible dusts) and the elimination of nuisances. In some cases, the economic justifications for such installations are obvious, but in others, one must appreciate the obligations toward maintaining the health and welfare of employees, neighbors, and the community.

For the intelligent selection or design of dust collection equipment, many factors must be considered. These are outlined in Table 1.

When it is realized that all of the above factors can bear on the choice of the proper dust collector for a given service, it is easy to see that a wide variety of collectors is needed and that **no single collector or type of collector is appropriate for all applications.** Such a variety is available commercially, and it would be impractical here to describe each in detail. However, the many types and designs may be conveniently grouped into six categories: **settling chambers, inertial separators, cyclones, filters, electrical precipitators, and scrubbers.** The principles of operation, the general physical descriptions, the advantages, and the limitations of each category are given in the following paragraphs.

Settling Chambers

The settling chamber is the simplest type of dust collector. It consists of an enclosure in which the velocity of the dust-laden stream is reduced to allow suspended particles to settle out by gravity and, once settled out, not to be re-entrained. Physically, settling chambers may range from a simple expanded duct section to an inlet hopper or inlet plenum for some other piece of equipment, or to a specially constructed chamber having tapered inlet and outlet sections, internal guide vanes, or even a large number of closely spaced horizontal shelves. They are usually "home-made" and

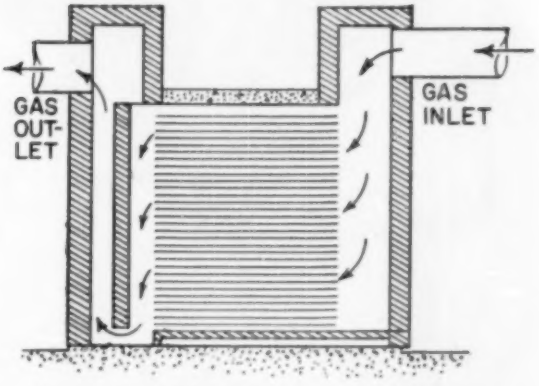

Figure 1: Multiple Tray Settling Chamber

very often are used as precleaners to reduce the load of large particulates to a second dust collector following in series. Simple settling chambers cannot be expected to provide adequate collection efficiencies for particles in the subsieve range (under 40 microns); multiple tray units (Figure 1), however, may be able to remove particles as small as 10 to 20 microns if properly designed. Collection efficiency is directly proportional to the total projected horizontal area within the chamber. Hence, the use of horizontal shelves increases over-all efficiency, but vertical baffles, other than those for straightening flow, are not, in general, of value. Efficiency is independent of chamber height, but obviously the unit should be sufficiently high to provide velocities low enough to prevent re-entrainment (normally less than 10 ft./sec.).

Settling chambers are of simple construction and low cost, and pressure loss is often negligible. Maintenance requirements are minimal, and material is collected dry and can be disposed of continuously. Temperature and pressure limitations are imposed only by the materials of construction. On the other hand, equipment size is large, with efficiency decreasing with diminishing particle size and very low efficiencies expected for small particles. Also, in the case of multiple-shelf units, cleaning difficulties and warping tendencies may be experienced, and plugging may occur at inlet concentrations above 1–5 grains/cu. ft.

Inertial Separators

In the second category, inertial separators, collectors utilize particulate inertia to cause the particles to mi-

DUST & FUME CONTROL SERIES
other articles in Jan. & Feb.

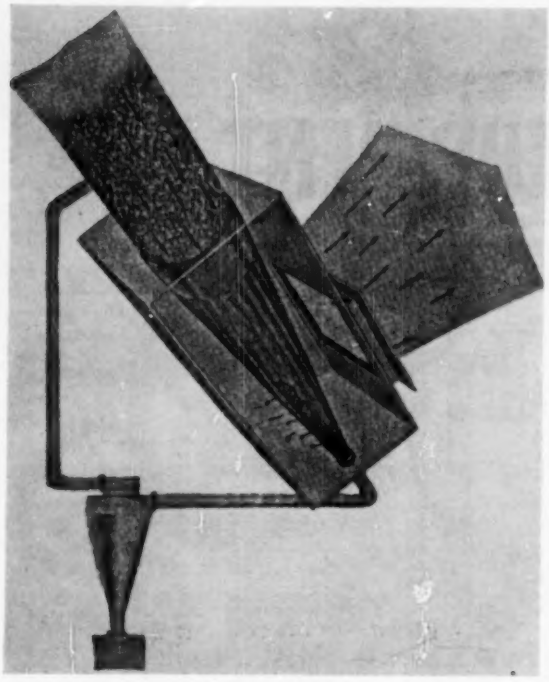

Figure 2: Louver Chamber

grate toward a collecting surface. Both simple inertial or impaction separators and cyclonic separators actually should be included here, but cyclones will be discussed separately because of their widespread applicability and importance in dust control.

Figure 3: Simple Cyclones

Inertial separators employ single or multiple changes in flow direction to cause particles to cross fluid streamlines and to concentrate or to impinge on a collecting surface. Performance of these devices is analyzed in terms of target efficiencies (fraction of particles in the fluid volume swept by an obstructing body which are collected by the body). Generally it may be said that efficiency increases with increasing particle size and density and with increasing fluid velocity. Efficiency decreases as the size of the obstructing body and as viscosity of the fluid increase.

Most inertial separators may be classified in one of four general types. One type, **the baffle chamber,** is an enclosure in which the gas stream is forced to follow a tortuous path around staggered plates. The gas, therefore, undergoes a series of sudden changes of direction causing suspended particles to impinge on the baffles. Such units are often combination inertial separators and settling chambers. The pressure drop, 0.5 to 1.5 in. H_2O, is greater than for a simple settling chamber, but the particle size capable of being collected is on the order of 20 microns rather than 40. Collected material is normally cleaned from the baffles by mechanical rapping or by a flowing water film. These units can be used in high-temperature service and for mist separation but they cannot handle tacky materials; also, abrasive wear can sometimes cause high maintenance costs.

The second type is **the orifice impaction collector,** very popular as a mist separator. Here, two successive sets of orifice plates are installed in series in the gas stream. The first set has staggered openings from one plate to another, which design promotes agglomeration of fine liquid particles. The second set of plates, at which collection occurs, contains aligned orifices. This type of collector is highly efficient for liquid aerosols larger than 2–3 microns because of the agglomerating feature. It is normally operated at orifice velocities on the order of 50–100 ft./sec., giving pressure drops of approximately 1–3 in. H_2O.

Louver chambers comprise the third type of inertial collector. In these devices (Figure 2), a series of closely spaced louvers are set at an angle to the air stream so that the particles strike the louvers, rebound, and travel toward the outlet end in increasing concentrations. The concentrated dust stream is then led off through a secondary air circuit to a separate collector. The louver chamber is, therefore, a particulate concentrator rather than an actual collector. The efficiency of this type of inertial collector depends on the louver spacing and the gas velocity; generally, particles larger than 10–15 microns can be collected satisfactorily at pressure drops near 1 in. H_2O. The principal advantages are simplicity, low cost, and high-temperature applicability. Chief disadvantages are a tendency to plug, excessive abrasive wear, and inability to handle tacky materials.

The fourth type of inertial separator is the so-called **high–velocity gas-reversal chamber.** In this type the gas stream is caused to change direction abruptly,

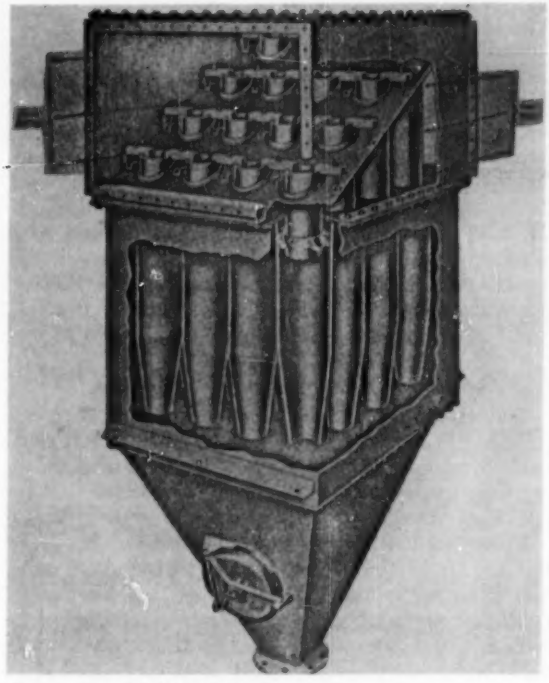

Figure 4: Multiple Cyclones

thereby projecting large particulates into a dead air space from which they are removed by gravity settling. This equipment, which is simple and low cost and may be appreciably smaller than simple settling chambers, gives adequate efficiencies only for particles larger than 40–50 microns.

Cyclones

Cyclones are probably the most widely used of all dust collectors. They consist of a cylindrical or conical chamber with a tangential entry and axial discharge. The inlet gas stream spirals downard along the wall and then upward and out through the center. Suspended particles are projected to the wall by centrifugal force where they fall by gravity toward the bottom of the unit.

There are three general types of cyclonic collectors: **the simple cyclone, high-efficiency multiple units, and mechanical cyclones.** Simple cyclones (Figure 3), are from one to as much as 15 or 20 feet in diameter. Inlet velocities are usually near 50 ft./sec. and pressure drops range from 0.5 to 3 in. H_2O. Simple cyclones may normally be expected to provide efficient collection of particles larger than 15 to 20 microns. Since cyclone diameter is the design factor having the greatest effect on efficiency, recent trends have been toward the second type, the high-efficiency multiple units, in which unit diameter is smaller and multiple cyclones are utilized in parallel (Figure 4). Pressure drops for these collectors may be in the range of 2 to 10 in. H_2O, but this type of design can extend efficient collection to particles as small as 5 to 10 microns.

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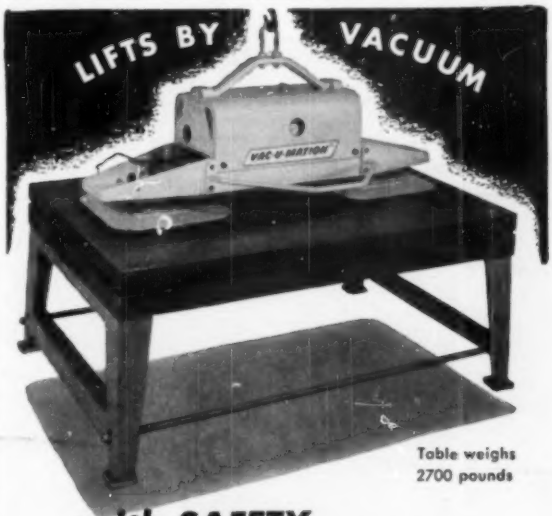

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Advantages of these first two cyclone types include low initial cost, relatively simple construction, dry and continuous disposal of collected material, low to moderate pressure loss, and relatively low maintenance costs where no highly abrasive materials are present. In addition, these units can be used very satisfactorily at high temperature or high pressure as long as appropriate materials of construction are used. Disadvantages are low efficiency for particles below 15 to 20 microns for simple cyclones and 5 to 10 microns for multiple units, and susceptibility to severe abrasive deterioration in certain cases.

Mechanical cyclones or dry centrifugal collectors (Figure 5), are identical in principle to the cyclonic collectors discussed above but they contain one or more motor-driven rotating elements. In such units, the particulates are concentrated at the periphery where they are removed through an annular slot or skimmer. The chief advantage of these units lies in their compactness and low pressure loss (pressure gains may even be found with some units). Collection efficiencies are roughly the same as for high-efficiency multiple cyclones. Their major limitation is a tendency for solids to build up on the rotating elements, causing plugging or rotor unbalance. Temperature limitations also exist because of the presence of bearings, seals, etc.

(This article will be continued in the January 1961 issue of "Safety Maintenance." It is based on an address presented at the 1960 Annual Meeting of the American Foundrymen's Society.)

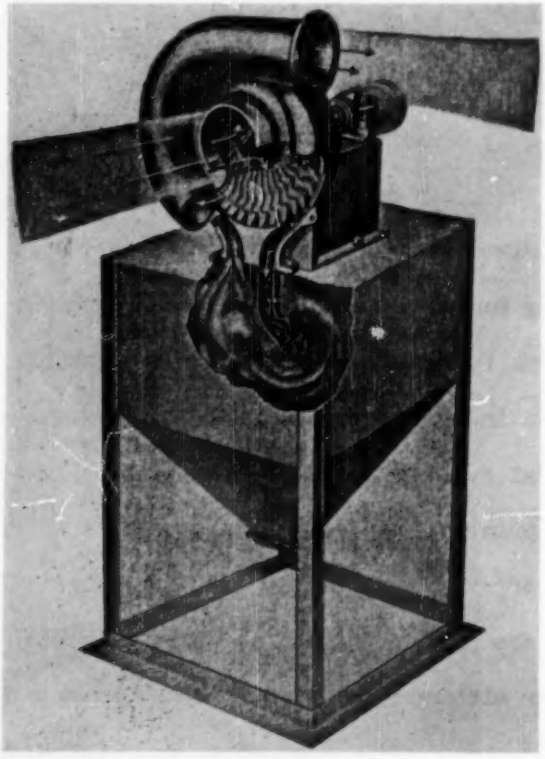

Figure 5: Mechanical Cyclone

Radioactive Air Filtration

Scientists at the Atomic Energy Commission's Hanford atomic plant can boast of air filtering systems that remove nearly 100 percent of radioactive particles from "hot" waste gas streams given off during the manufacture of plutonium.

The Hanford high-efficiency filters, in use throughout most of the giant nuclear plant, trap at least 99.95 percent of the microscopically small radioactive matter created by the plutonium process, General Electric scientists report.

War Research Outgrowth

The up-to-date Hanford space filters, as they are called, are actually an outgrowth of research done prior to and during World War II aimed at developing filter media from a variety of fibrous materials for use in gas masks and in ventilation air systems.

Filters are used individually in laboratory hoods, or in large banks able to clean many thousands of cubic feet of air per minute. Composed of glass fiber paper consisting of tiny fibers approximately 1/28,000 of an inch in diameter, a single filter unit alone can purify 1,000 cubic feet of air a minute.

All filters at the atomic plant are constructed of fire-resistant materials to prevent the possibility of one catching fire and spreading potentially harmful radioactive material.

Meet Rigid Standards

To make sure the commercially made filters are up to rigid AEC and company standards, General Electric carries out its own large-scale filter testing program with such up-to-date equipment as smoke-generating penetrometers, which literally "smoke" out defects in filters invisible to the naked eye.

In a typical performance test, the new filter is placed in the precisely controlled penetrometer, which heats oil (dioctylphthalate) to approximately 400 degrees fahrenheit. At this temperature, the oil forms a smoke composed of tiny droplets about 1/100,000 of an inch in diameter which is blown through the filter.

A sensitive light-scattering photoelectric cell measures the smoke before and after it is passed through the filter, and from these measurements, Hanford technicians can determine the filter's efficiency in trapping particulate matter.

Checks Pressure Drop

The penetrometer also checks for pressure drop characteristics, to insure that the filter does not impose excessive resistance to the flow of air.

The Hanford filter testing program is carried out by General Electric's Industrial Hygiene Operation, and is one of two such filter testing programs in the country sponsored by the AEC. In addition to meeting the needs of Hanford components, Hanford provides these testing services for all AEC cost-type contractor sites west of the Mississippi.

THE SAFETY LIMITS OF HAZARDOUS MATERIALS

THRESHOLD LIMIT VALUES FOR 1960

Adopted at the Twenty-Second Annual Meeting of the American Conference of Governmental Industrial Hygienists, Rochester, New York, April 23–26, 1960

Threshold limits should be used as guides in the control of health hazards and should not be regarded as fine lines between safe and dangerous concentrations. They represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse effect. The values listed refer to time-weighted average concentrations for a normal work-day. The amount by which these figures may be exceeded for short periods without injury to health depends upon a number of factors such as the nature of the contaminant, whether very high concentrations even for short periods produce acute poisoning, whether the effects are cumulative, the frequency with which high concentrations occur, and the duration of such periods. All must be taken into consideration in arriving at a decision as to whether a hazardous situation exists. Special consideration should be given to the application of these values in the evaluation of the health hazards which may be associated with exposure to combinations of two or more substances.

Threshold limits are based on the best available information from industrial experience, from experimental studies, and, when possible, from a combination of the two. These values are based on various criteria of toxic effects or on marked discomfort; thus, they should not be used as a common denominator of toxicity, nor should they be considered as the sole criterion in proving or disproving diagnosis of suspected occupational disease.

These limits are intended for use in the field of industrial hygiene and should be employed by persons trained in this field. They are not intended for use, or for modification for use, in the evaluation or control of community air pollution or air-pollution nuisances.

These values are reviewed annually by the Committee on Threshold Limits for changes, revisions, or additions as further information becomes available. The Committee welcomes the suggestion of substances to be added to the list and also comments, references, or reports of experience with these materials.

RECOMMENDED VALUES
Gases and Vapors

Substance	PPM*	Approx. Mg. per Cu. M.†
Acetaldehyde	200	360
Acetic acid	10	25
Acetic anhydride	5	20
Acetone	1000	2400
Acetylene-tetrabromide	1	14
Acrolein	0.5	1.2
Acrylonitrile	20	45
Allyl alcohol	5	12
Allyl chloride	5	15
Allyl propyl disulfide	2	12
Ammonia	100	70
Amyl acetate	200	1050
Amyl alcohol (isoamyl alcohol)	100	360
Aniline	5	19
Arsine	0.05	0.2
Benzene (benzol)	25	80
Benzyl chloride	1	5
Boron trifluoride	1	3
Bromine	0.1	0.7
Butadiene (1, 3-butadiene)	1000	2200
Butanone (methyl ethyl ketone)	250	740
Butyl acetate (n-butyl acetate)	200	950
Butyl alcohol (n-butanol)	100	300
Butylamine	5	15
Butyl cellosolve (2-butoxyethanol)	50	240
Carbon dioxide	5000	9000
Carbon disulfide	20	60
Carbon monoxide	100	110
Carbon tetrachloride	25	160
Cellosolve (2-ethoxyethanol)	200	740
Cellosolve acetate (2-ethoxyethyl acetate)	100	540
Chlorine	1	3
Chlorine dioxide	0.1	0.3
Chlorine trifluoride	0.1	0.4
Chlorobenzene (monochlorobenzene)	75	350
Chloroform (trichloromethane)	50	240
1-Chloro-1-nitropropane	20	100
Chloropicrin	0.1	0.7
Chloroprene (2-chloro-1, 3-butadiene)	25	90
Cresol (all isomers)	5	22
Cyclohexane	400	1400
Cyclohexanol	100	410
Cyclohexanone	100	400

(Continued on next page)

Cyclohexene	400	1350
Decaborane	0.05	0.3
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	50	240
Diborane	0.1	0.1
o-Dichlorobenzene	50	300
Dichlorodifluoromethane	1000	4950
1, 1-Dichloroethane	100	400
1, 2-Dichloroethane (ethylene dichloride)	100	400
1, 2-Dichloroethylene	200	790
Dichloroethyl ether	15	90
Dichloromonofluoromethane	1000	4200
1, 1-Dichloro-1-nitroethane	10	60
Dichlorotetrafluoroethane	1000	7000
Diethylamine	25	75
Difluorodibromomethane	100	860
Diisobutyl ketone	50	290
Dimethylaniline (N-dimethylaniline)	5	25
Dimethyl formamide	20	60
1, 1-Dimethyl hydrazine	0.5	1
Dimethylsulfate	1	5
Dipropylene glycol methyl ether	100	600
Dioxane (diethylene dioxide)	100	360
Ethyl acetate	400	1400
Ethyl acrylate	25	100
Ethyl alcohol (ethanol)	1000	1900
Ethylamine	25	45
Ethylbenzene	200	870
Ethyl bromide	200	890
Ethyl chloride	1000	2600
Ethyl ether	400	1200
Ethyl formate	100	300
Ethyl silicate	100	850
Ethylene chlorohydrin	5	16
Ethylenediamine	10	30
Ethylene dibromide (1, 2-dibromoethane)	25	190
Ethylene imine	5	9
Ethylene oxide	50	90
Fluorine	0.1	0.2
Fluorotrichloromethane	1000	5600
Formaldehyde	5	6
Furfural	5	20
Furfuryl alcohol	50	200
Gasoline	500	2000
Heptane (n-heptane)	500	2000
Hexane (n-hexane)	500	1800
Hexanone (methyl butyl ketone)	100	410
Hexone (methyl isobutyl ketone)	100	410
Hydrazine	1	1.3
Hydrogen bromide	5	17
Hydrogen chloride	5	7
Hydrogen cyanide	10	11
Hydrogen fluoride	3	2
Hydrogen peroxide, 90%	1	1.4
Hydrogen selenide	0.05	0.2
Hydrogen sulfide	20	30
Iodine	0.1	1
Isophorone	25	140
Isopropylamine	5	12
Mesityl oxide	25	100
Methyl acetate	200	610
Methyl acetylene	1000	1650
Methyl acrylate	10	35
Methylal (dimethoxymethane)	1000	3100
Methyl alcohol (methanol)	200	260
Methyl bromide	20	80
Methyl cellosolve (2-methoxyethanol)	25	80
Methyl cellosolve acetate (ethylene glycol monomethyl ether acetate)	25	120
Methyl chloride	100	210
Methyl chloroform (1, 1, 1-trichloroethane)	500	2700
Methylcyclohexane	500	2000
Methylcyclohexanol	100	470
Methylcyclohexanone	100	460
Methyl formate	100	250
Methyl isobutyl carbinol (methyl amyl alcohol)	25	100
α-Methyl styrene	100	480
Methylene chloride (dichloromethane)	500	1750
Monomethyl aniline	2	9
Naphtha (coal tar)	200	800
Naphtha (petroleum)	500	2000
Nickel carbonyl	0.001	0.007
Nitric acid	10	25
p-Nitroaniline	1	6
Nitrobenzene	1	5
Nitroethane	100	310
Nitrogen dioxide	5	9
Nitroglycerin	0.5	5
Nitromethane	100	250
2-Nitropropane	50	180
Nitrotoluene	5	30
Octane	500	2350
Ozone	0.1	0.2
Paradichlorobenzene	75	450
Pentane	1000	2950
Pentanone (methyl propyl ketone)	200	700
Perchloroethylene (tetrachlorethylene)	200	1350
Phenol	5	19
Phenylhydrazine	5	22
Phosgene (carbonyl chloride)	1	4
Phosphine	0.05	0.07
Phosphorus trichloride	0.5	3
Propyl acetate	200	840
Propyl alcohol (isopropyl alcohol)	400	980
Propyl ether (isopropyl ether)	500	2100
Propylene dichloride (1, 2-dichloropropane)	75	350
Propylene imine	25	60
Propylene oxide	100	240
Pyridine	10	30
Quinone	0.1	0.4
Stibine	0.1	0.5
Stoddard solvent	500	2900
Styrene monomer (phenylethylene)	100	420
Sulfur dioxide	5	13
Sulfur hexafluoride	1000	6000
Sulfur monochloride	1	6
Sulfur pentafluoride	0.025	0.25
Tertiary butyl alcohol	100	300
p-Tertiary butyl toluene	10	60
1, 1, 2, 2-Tetrachloroethane	5	35
Tetrahydrofuran	200	590
Tetranitromethane	1	8
Toluene (toluol)	200	750
o-Toluidine	5	22
Tolyene-2, 4-diisocyanate	0.1	0.7
Trichloroethylene	200	1050
Triethylamine	25	100
Trifluoromonobromomethane	1000	6100
Turpentine	100	560
Vinyl chloride (chloroethylene)	500	1300
Vinyl toluene	100	480
Xylene (xylol)	200	870
Xylidine	5	25

** Parts of vapor or gas per million parts of air by volume.*
† Approximate milligrams per cubic meter of air.

Toxic Dusts, Fumes, and Mists

Substance	*Mg. per Cu. M.†*
Aldrin (1, 2, 3, 4, 10, 10-hexachloro-1, 4, 4a, 5, 8, 8a-hexahydro-1, 4, 5, 8-dimethanonaphthalene)	0.25
Ammate (ammonium sulfamate)	15
Antimony	0.5
ANTU (alpha-naphthyl-thiourea)	0.3
Arsenic	0.5
Barium (soluble compounds)	0.5
Beryllium	0.002
Cadmium oxide fume	0.1
Calcium arsenate	0.1
Chlordane (1, 2, 4, 5, 6, 7, 8, 8-octachloro-3a, 4, 7, 7a-tetrahydro-4, 7-methanoindane)	2

Chlorinated camphene, 60%	0.5
Chlorinated diphenyl oxide	0.5
Chlorodiphenyl (42% chlorine)	1
Chlorodiphenyl (54% chlorine)	0.5
Chromic acid and chromates (as CrO_3)	0.1
Crag herbicide (sodium 2-(2, 4-dichlorophenoxy) ethanol hydrogen sulfate)	15
Cyanide (as CN)	5
2, 4-D (2, 4-dichlorophenoxyacetic acid)	10
DDT (2, 2-bis (p-chlorophenyl)-1, 1, 1-trichloroethane)	1
Dieldrin (1, 2, 3, 4, 10, 10-hexachloro-6,7-epoxy-1, 4, 4a, 5, 6, 7, 8, 8a-octahydro-1, 4, 5, 8-dimethano-naphthalene)	0.25
Dinitrobenzene	1
Dinitrotoluene	1.5
Dinitro-o-cresol	0.2
EPN (O-ethyl O-p-nitrophenyl thionobenzenephosphonate)	0.5
Ferbam (ferric dimethyl dithiocarbamate)	15
Ferrovanadium dust	1
Fluoride	2.5
Hydroquinone	2
Iron oxide fume	15
Lead	0.2
Lead arsenate	0.15
Lindane (hexachlorocyclohexane, gamma isomer)	0.5
Lithium hydride	0.025
Magnesium oxide fume	15
Malathion (O, O-dimethyl dithiophosphate of diethyl mercaptosuccinate)	15
Manganese	5
Mercury	0.1
Mercury (organic compounds)	0.01
Methoxychlor (2, 2-di-p-methoxyphenyl-1, 1, 1-trichloroethane)	15
Molybdenum	
(soluble compounds)	5
(insoluble compounds)	15
Nicotine	0.5
Parathion (O, O-diethyl-O-p-nitrophenyl thiophosphate)	0.1
Pentachloronaphthalene	0.5
Pentachlorophenol	0.5
Phosphoric acid	1
Phosphorus (yellow)	0.1
Phosphorus pentachloride	1
Phosphorus pentasulfide	1
Picric acid	0.1
Pyrethrum	2
Rotenone	5
Selenium compounds (as Se)	0.1
Sodium fluoroacetate (1080)	0.1
Sodium hydroxide	2
Strychnine	0.15
Sulfuric acid	1
TEDP (tetraethyl dithionopyrophosphate)	0.2
TEPP (tetraethyl pyrophosphate)	0.05
Tellurium	0.1
Tetryl (2, 4, 6-trinitrophenylmethylnitramine)	1.5
Thallium (soluble compounds)	0.1
Thiram (tetramethyl thiuram disulfide)	5
Titanium dioxide	15
Trichloronaphthalene	5
Trinitrotoluene	1.5
Uranium	
(soluble compounds)	0.05
(insoluble compounds)	0.25
Vanadium	
(V_2O_5 dust)	0.5
(V_2O_5 fume)	0.1
Warfarin (3-(α-acetonylbenzyl)-4-hydroxycoumarin)	0.5
Yttrium	5
Zinc oxide fume	15
Zirconium compounds (as Zr)	5

§*Milligrams of dust, fume, or mist per cubic meter of air.*

Radioactivity: For permissible concentrations of radioisotopes in air, see U. S. Department of Commerce, National Bureau of Standards, Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," June 5, 1959. Also see U. S. Department of Commerce, National Bureau of Standards, Handbook 59, "Permissible Dose from External Sources of Ionizing Radiation," September 24, 1954, and addendum of April 15, 1958.

Mineral and Non-Metallic Inorganic Dusts

Substance	MPPCF‡
Silica	
Quartz	
high (above 50% free silica)	5
medium (5 to 50% free silica)	20
low (below 5% free silica)	50
Cristobalite (above 5%)	5
Amorphous	20
Silicates	
Asbestos	5
Mica	20
Portland Cement	50
Soapstone	20
Talc	20
Miscellaneous, including:	
Aluminum oxide	50
Calcite	50
Dolomite	50
Limestone	50
Marble	50
Silicon Carbide	50

‡ *Millions of particles per cubic foot of air based on impinger samples counted by lightfield techniques.*

Tentative Values

Substance	PPM	Approx. Mg. per Cu. M.
Acetonitrile	40	70
Allyl glycidyl ether (AGE)	10	45
Boron oxide		15
n-Butyl glycidyl ether (BGE)	50	270
Butyl mercaptan	10	35
Chloroacetaldehyde	1	3
Chlorobromomethane	200	1050
DDVP (O, O-Dimethyl-2, 2-dichlorodivinyl phosphate)		1
Diglycidyl ether (DGE)	10	55
Ethyl mercaptan	250	640
Glycidol	50	150
sec-Hexyl acetate	100	590
Isopropyl glycidyl ether (IGE)	50	240
Ketene	0.5	0.9
Methyl mercaptan	50	100
1-Nitropropane	25	90
Pentaborane	0.005	0.01
Perchloromethyl mercaptan	0.1	0.8
Phenyl glycidyl ether (PGE)	50	310
Phosdrin		0.1
n-Propyl nitrate	25	110
Systox		0.2
Teflon decomposition products	0.005	
1, 2, 3-Trichloropropane	50	300
1, 1, 2-Trichloro-1,2, 2-trifluoroethane	1000	7600
Triorthocresyl phosphate		0.1

From the A. M. A. Archives of Environmental Health, August, 1960.

No. 1 Safe Driver

Are Present Methods of Testing Driver Ability Adequate?

Instruments used in recording data on driving abilities are inspected by (l. to r.) Edward Edmond, National Safety Council; Alex Keilen, named nation's safest driver; and Dr. James L. Malfetti, Columbia University.

Minnesota Highway Patrolman Alex J. Keilen was selected as the nation's "outstanding safe driver" in the 1200-mile "Telar" Safety Drive, which climaxes the first national study of what makes safe drivers safe.

The special project, sponsored by the Du Pont Company in cooperation with the Safety Research and Education project of Teachers College, Columbia University and the National Safety Council, pin-points for the first time what appears to be the two crucial measurements of safe driving—judgment of speed and smoothness of ride. As a result, the project has uncovered some key characteristics of safe drivers which raise questions about the validity of many of our present techniques for measuring a driver's on-the-road ability.

The 52-year-old patrolman from Montevideo, Minnesota, competed in the three-day drive from "the nation's ice-box" in Fraser, Colorado to Furnace Creek in California's Death Valley with runner-up Charles J. Espich, 58-year-old long-haul truck driver from Fort Wayne, Indiana. The drive subjected the men to every type of road, weather and temperature condition normally experienced in a full year of motoring and was made in a station wagon specially instrumented by Dodge engineers to measure all aspects of driving.

Espich and Keilen, both National Safety Council 25-year award winners, were chosen from six semi-finalists on the basis of an intensive "autonaut" testing program which followed selection by Remington Rand's Univac from nearly 300,000 professional drivers in the Safety Council's award program.

Conducting the Fraser-Furnace Creek run were Professor Amos E. Neyhart of Pennsylvania State University, regarded as America's pioneer in driver education, and Edward J. Emond of the National Safety Council's winter hazards committee. Professor Neyhart, in a preliminary report of the competitor's performance, cited the extraordinary fact that Mr. Keilen drove so skillfully that he was never required to make a sudden stop. An average motorist would probably make at least one such stop in his daily commuting. Professor Neyhart added:

"Both drivers demonstrated the unusual ability of 'total concentration' on the driving task so that their eyes never once left the road and, in a matter of minutes after beginning to drive, they had even forgotten that they were in a test or competitive situation. They drove as they normally do in their jobs. The selection of the one 'outstanding safe driver' from two very 'outstanding safe drivers' was most difficult."

Dr. James L. Malfetti, executive officer of the Columbia University program, declared in evaluating preliminary project results "we have uncovered what appears to be very significant findings in both the area of what makes safe drivers safe as well as a new area—the probability that portable instrumentation devices can be developed which can fairly and most accurately measure what appear to be critical indexes of on-the-road driving performance.

Safe Drivers Have Built-In Computers

"Further, we have isolated what seems to be a most significant factor in safe driving, the safe driver's ability to organize instantly all of the factors in a complex driving situation so that he does the appropriate and correct action much on the level of a simple reflex action. It is this high-speed 'computer mechanism' which apears to be one of the main differences between a safe, average, or unsafe driver."

The organizational ability of safe drivers which permits them to do the right thing at the right time, regardless of age or physical characteristics, caused Dr. Malfetti to suggest:

"There is reason to raise questions about the validity of some of our standard laboratory techniques for predicting or measuring driver's on-the-road ability. Some physical characteristics and psychomotor abilities such as simple reaction time which are now thought to be important by authorities, do not seem to be meaningful when related to a group of proved safe drivers."

Information from a wide range of testing instruments was combined with observational ratings made by the two-man team to evaluate driver performance. Included in the skill-testing equipment was a tachograph to give a graphic record of the entire run; an accelerometer, a brakeometer, a jerkometer,

to record evenness of driver's performance; and a special speedometer to test speed estimating abilities. The high correlation between the judges observations and the instrumented record suggested that a small portable battery of instruments could work well in testing a large group of drivers and ultimately play an important part in licensing, selection and training of drivers.

Keilen has been a Minnesota highway patrolman for the past 25 years, and drove a total of 33,000 miles last year. He has received the National Safety Council's Safe Driver Award for 25 consecutive years.

Espich has been a driver for the Navajo Freight Lines of Denver for the past 18 years. He has been driving professionally for 42 years and in 1959 drove a total of 97,000 miles. He has won the National Safety Council's Safe Driver Award for 28 consecutive years.

The specially-equipped Dodge station wagon, has been part of a 400-car fleet used by Du Pont in a five-year road-testing program for their new anti-freeze and summer coolant product. The car was also outfitted with special safety devices, including safety belts, recessed hub steering wheel, safety padding and safety door locks as well as accessory items ranging from cross-bar chains, first-aid kits, fire extinguishers and special windshield wipers.

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Seat Belts for Government Vehicles

Secretary of Labor James P. Mitchell has urged all Federal agencies to adopt a Federal Safety Council recommendation that seat belts be used on government-owned motor vehicles. In a letter to agency heads the Secretary pointed out that the Council's recommendation was based on prior study and the experience of agencies which have installed safety belts in their vehicles. The belts substantially reduce death and injury from accidents, it was learned.

"Vehicle accidents are the greatest single cause of occupational death in the Federal service," Mr. Mitchell said, "accounting for 35 fatalities in 1958 at an average cost of $43,800. Direct costs to the Government for more than 2,800 traffic injuries to its employees that year were $2½ million."

The Federal Government operates about 250,000 motor vehicles in the United States and abroad, excluding those assigned to tactical military units.

The use of seat belts is also publicly supported by the American Medical Association, the American College of Surgeons, the National Safety Council, the U. S. Public Health Service, and other organizations.

The Federal Safety Council, representing various Government agencies, advises the Secretary of Labor on safety standards for Federal employees.

Compensation Law Changes for Michigan, Rhode Island

New editions of the Michigan and Rhode Island workmen's compensation law pamphlets have been published by the Association of Casualty and Surety Companies.

The Association said the revised pamphlets incorporate important changes in the Michigan and Rhode Island laws. Each contains a digest and complete text of the workmen's compensation law and pertinent supplementary laws, including all amendments enacted by the 1960 legislative sessions. Annotations of cases decided since publication of the latest editions also are included.

Copies may be obtained from the Editor, Law Publications, Association of Casualty and Surety Companies, 60 John Street, New York 38, N. Y. at $1.50 each, plus applicable sales tax, which price includes any supplement issued prior to re-publication of the pamphlet.

Safety Guide On Plastic Foams

Fire-safe storage of plastic foams calls for no special precautions beyond those typically afforded piles of lumber and other such combustibles, the Manufacturing Chemists' Association, Inc., says in its latest Safety Guide. The ignition properties of plastic foams, according to the guide, are no more hazardous than those of other common solids.

Reasonable safeguards, the Association emphasizes, are necessary in the storage, handling and fabrication of plastic foams in order to avoid ignition. However, such safeguards and "good housekeeping practices" would also be necessary in the handling, storage and fabrication of other common solids.

The safety guide points out that traces of a hydrocarbon blowing agent in foams lowers the flash ignition temperature 200 to 300 degrees. However, this is well above the temperature of potential ignition sources such as steam lines, hot water pipes, molten tar, etc.

In pointing out the fire dangers in various types of plastic foams the Association states that thermoplastic foams tend to melt away from the source of heat thus reducing the likelihood of ignition. Flexible urethene foams will not self heat nor spontaneously ignite if proper catalyst systems are used, the Association states. The pamphlet cautions against inadequate ventilation in areas of plastic foam fabrication in as much as the various blowing agents are toxic to varying degrees. The same cautions that would be taken with lumber with regards to fires would also apply during the transfer and storage of plastic foams, it points out.

The Association safety guide recommends that, in case of fire, water should be used on the flames or they should be smothered. "Storage piles of plastic foam, whether permanent or temporary, should be protected by sprinklers or readily available hand hoses," the Association says.

The safety guide, entitled "Plastic Foams—Storage, Handling and Fabrication" is available at the MCA headquarters office, 1825 Connecticut Ave., N. W., Washington 9, D. C. for 20 cents a copy.

Laminated Wood Block Flooring Standard

Quality criteria for "Laminated Hardwood Block Flooring" is covered by a recommended Commercial Standard which has just been circulated to the industry for approval, according to the Commodity Standards Division, Office of Technical Services, Business and Defense Services Administration, U. S. Department of Commerce.

The new standard covers tongued and grooved 9" by 9" by $\frac{15}{32}$" thick hardwood plywood blocks in two grades with either unfinished or prefinished faces. It was requested by the Hardwood Plywood Institute to provide a common basis of understanding for this type of flooring among manufacturers, architects, builders, distributors, and flooring contractors. Other interested organizations cooperated in the preparation of this standard.

Its general acceptance by all concerned is being determined in order that it may be established with the voluntary endorsement of the trade, and become widely effective through national recognition and general use.

Copies of the Recommended Standard, TS-5506, are available without charge, while the supply lasts, from the Commodity Standards Division, U. S. Department of Commerce, Washington 25, D. C.

Ultrasonic Welding

The American Welding Society announces the publication of a new booklet "Ultrasonic Welding." Containing 38 pages and 29 illustrations, the booklet meets a growing demand for authoritative technical literature on new developments in the welding industry.

Prepared by a committee of experts in the ultrasonic welding, metallurgical, manufacturing, and research fields, the book discusses concisely the process which, of all welding processes, is regarded by some as having the greatest potential for future development. Many similar and dissimilar metals which were previously considered unweldable can be welded by this process. By introducing a high fre-

quency vibratory energy into the metals, ultrasonic welding produces a sound metallurgical bond without arc or spark, melting of the base metals, or deformation of the materials being welded.

The booklet, a reprint of material published in Section III of the "Welding Handbook" (4th Edition), contains sections discussing fundamentals of the process, the metals which can be welded, welding techniques, weld characteristics, quality control, equipment, and applications. In addition, a brief bibliography and index are included.

"Ultrasonic Welding" is one of a series of American Welding Society publications dealing with specific processes or subjects and designed to act as compact, comprehensive guides to new processes and methods. Copies, at $1.50 each, may be obtained from the American Welding Society, 33 West 39th Street, New York 18, N. Y.

Alleged & Exaggerated Compensation Claims

Here is a practical and informative pamphlet that takes a hard look at the problem of "How to Control Alleged and Exaggerated Claims in Workmen's Compensation." Covering administrative, medical and legal aspects of claims that are not based on facts, the 22-page booklet is designed for coordinated use by a company's safety director, plant manager, plant doctor, and legal adviser.

Written by Joseph A. De Luca, Jr., well-known consulting engineer, the booklet points out what steps to take in advance to prevent exaggerated false claims later and what to do in presenting a formal claim of "allegation" or "exaggeration" of an occupational injury. The author is careful at all times to make a clear distinction between genuine injury claims and those motivated by the "ethically confused."

The presentation of the material is streamlined, with a helpful synopsis of each page printed at the bottom of the page. Mr. De Luca avoids, fortunately, the use of legal jargon; and, in fact, intentionally uses the language of safety engineering. Although some of the passages are not easy reading, the author has for the most part been successful in making his points readily understandable and the booklet should be particularly useful, as intended, in persuading business and professional collaborators to discuss their common problems in terms that will be meaningful to all.

The work's special value is in the guidance it offers for new, definite action. Since the problem of untrue injury claims can only be handled successfully by the cooperative action of the plant manager, safety supervisor, plant doctor and legal advisor, the pamphlet must be made available to all four of these individuals; and therefore the pamphlets are sold only in units of four. Prices start at $8.80 per set of four, with discounts for quantity orders by the set. They are available form: New Forum Publishing Co., P. O. Drawer 2724, Wilmington 5, Del.

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(For details, use Key # Z-13 on card on page 11)

JUNIOR WISE OWLS: Charter members of the Junior Wise Owl Club of America are Robert K. Chapin (left) of Mahwah, N. J., and Edward L. Sinclair of Greenwich, Conn. Both 13-year-olds saved their eyes with protective eyewear worn because of their fathers' knowledge of industrial safety lenses.

Fathers' Safety Sightedness Saves Sons' Eyes

Junior Wise Owl Club Formed

Formation of the Junior Wise Owl Club of America, an organization to encourage eye safety among youth, was announced recently by the National Society for the Prevention of Blindness.

Modeled on the highly successful senior Wise Owl Club of America, the junior group will enroll all those youths, both boys and girls, who have saved their eyesight by wearing eye protection at the time of potentially blinding accidents.

Safety aims of the new Junior Wise Owls will be the replacement of regular street lenses with shatterproof lenses for pre-teeners and teenagers who wear glasses regularly, and the faithful use of safety glasses or other types of protective eyewear by those youngsters engaged in hazardous activities of any kind.

The Junior Wise Owl Club was organized formally in October with the presentation of charter membership certificates and pins to two 13-year-olds, one from New Jersey and the other from Connecticut, who owe their eyesight to shatterproof safety lenses.

"With the establishment of a Junior Wise Owl movement, we hope to match among American children the magnificent sight-saving record achieved in industry with the help of the Wise Owl Club," declared Dr. John W. Ferree, executive director of the National Society for the Prevention of Blindness.

The internationally known adult Wise Owl Club, which accepts as members only those workers who have saved their vision with eye protection at the time of on-the-job accidents, has gained a membership of more than 20,000 since it was formed in 1947 at the suggestion of an employee of the St. Louis plant of ACF Industries, Inc. Shortly afterward, sponsorship of the club was assumed by the National Society for the Prevention of Blindness, the nation's only voluntary health agency devoted totally to sight conservation.

"Pioneers in the field of eye safety," said James E. O'Neil, director of industrial service for the National Society for the Prevention of Blindness, "realize that, along with the progress toward 100 percent safety in industry, there is an immediate need for a carry-over for accident prevention into the home, playground and school. This will be a prime aim of the Junior Wise Owl Club."

Membership in the Junior Wise Owls will be granted to any preschool child, grammar or high school student whose sight is saved from injury or destruction through the use of spectacles with safety lenses, either with or without correction, or other recognized or approved eye protective devices such as goggles or face shields.

Membership Eligibility

Junior Wise Owl eligibility will be determined on information submitted to the National Society for the Prevention of Blindness by the ophthalmologist, optometrist or optician who prescribed and/or made the safety spectacles worn by the youngster at the time of the sight-saving incident. In cases where safety eyewear other than with lenses ground to individual prescription were involved, a statement from school administrators, teachers, parents, or other responsible persons would be acceptable, Mr. O'Neil said.

Safety-conscious parents, familiar with eye protection and Wise Owl Clubs from their jobs, were responsible for the sight-saving eyewear worn by both charter members of the Junior Wise Owl Club at the time of their accidents.

First Members

Robert K. Chapin, 13, while clearing a field at his home at Mahwah, N. J., was wearing a pair of safety glasses given him by his father, a senior metallurgist in American Brake Shoe's Mahwah Research center. Rob was hammering at a rock when suddenly a large fragment struck the left lens of the glasses with sufficient force to crack the lens. The eye was not harmed.

Teenager Edward L. Sinclair of Greenwich, Connecticut, the second charter Junior Wise Owl member, was leaving Sunday School in his home town and accidentally toppled down a flight of stairs. His face scraped roughly along the metal and stone stairway. Edward's glasses were badly damaged and battered but his eyes were not injured, thanks to the prescription safety lenses purchased at the insistence of his father, Edward L. Sinclair, manager of the Socony Mobil Company's engineering department in New York City.

THE FIRE FRONT

September Losses Drop

Estimated fire losses in the United States during September amounted to $81,845,000, the National Board of Fire Underwriters has reported. According to Lewis A. Vincent, NBFU's general manager, this loss represents a decrease of 1.4 percent below losses of $83,027,000 reported for September 1959, and a decrease of 9.1 percent under losses of $90,037,000, for last August.

Losses for the first nine months of 1960 now total $828,851,000, an increase of 3.5 percent over the first nine months of 1959, when they amounted to $800,887,000. These estimated losses include an allowance for uninsured and unreported losses.

Fire Detection Vital

"Detection of fire is the first step in the fire control operation and ideally detection should occur simultaneously with ignition of the fire," states the "Quarterly (April 1960) of the National Fire Protection Association."

A review of 1959's large loss building fires underscores the need for prompt detection. During that year there were 331 fires—113 of them industrial—and each one of them consumed over $250,000 of property. Their total loss was $173,000,000.

In the majority of cases the story is the same. Delayed discovery, slow reporting, no watchmen, no detection equipment.

How far this loss would have been slashed if all of these 331 buildings had been equipped with a fire detection system which triggered a prompt alarm to municipal fire headquarters or a central station is anyone's guess. However, it is clear that the total loss would be only a fraction of $173 million.

What are fire detection-alarm systems? How do they work? Are they expensive? Here are some of the answers. Of the two most conventional fire detection methods (independent of water flow alarms), one employs the rate-of-temperature-rise to signal fire while the other gives warning when a set temperature is reached, usually 135° or 180° F. In some equipment both principles are used.

In typical examples of the rate-of-temperature-rise method of fire detection, the systems employ small diameter copper tubing which passes through the space(s) to be monitored—usually at or near ceiling height. Each end of the tubing is attached to opposite sides of a bellows-like device. Any abnormal temperature rise causes air in the tubing to expand and, exerting

(Continued on page 48)

Automatic Fire Safety Quiz

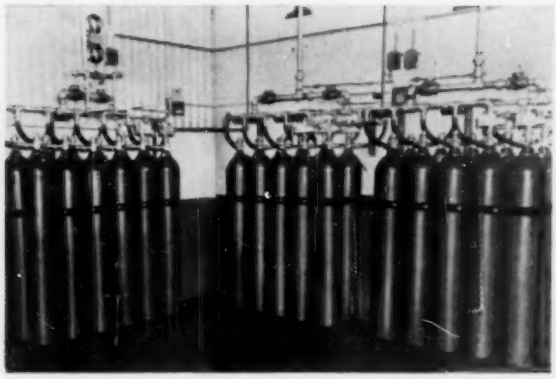
A new push-button fire safety quiz with a "house" that "bursts into flames" when people being tested show a lack of knowledge about fire safety practices, has been introduced by Aetna Casualty and Surety Company.

The two-minute, 10-question quiz was first made available for public testing in Hartford, Conn., during National Fire Prevention Week.

Developed to call attention to fundamental fire safety rules, the quiz will be used by the company's representatives for testing before civic groups, schools and other organizations in their communities. A total of 15 of the devices are available.

Participants push one of two buttons in response to true-false questions automatically flashed on a panel before them. The device will light up the word "safe" if the answer is correct, shoot flames from the house if it's wrong.

The questions deal with home fire prevention practices as well as with emergency procedures during a house fire. In addition, score cards explaining the correct answers are given those taking the test.



Fire control system includes these 3275 pound capacity CO_2 cylinders. Each one of two groups (right) guards a new mill.

Wherever they may be working, employees are about arm's length from protection of a modern portable extinguisher.

AUTOMATIC PROTECTION FOR ALUMINUM FOIL MILL

Glistening aluminum foil—eventually to be used in a growing multitude of ways by industry and housewives around the world—is "custom milled" in giant lots at the bustling Louisville, Kentucky, rolling mill plant of Anaconda Aluminum Company.

A visitor to the modern plant witnesses seemingly infinite miles of the gleaming foil winding off-and-on king size spindles and pouring continuously through always-purring cold-rolling mills. At no time, day or night, are the precision high speed mills idle for more than a few minutes . . . good evidence of the heavy and steadily increasing demand for the company's quality product. Sparkling foil, awaiting its turn to be milled to desired thickness, or extra-strength "thinness," fills practically every available inch of the neat, well fire protected plant.

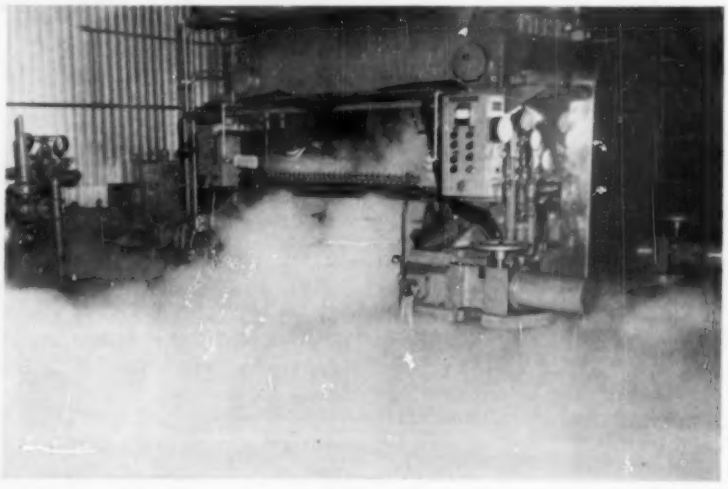
Anaconda Aluminum, also at Louisville, and integrated with its foil rolling operations, produces a wide variety of laminated, colored, embossed, coated and specially treated foils which have been finding broader and broader markets.

The company's cold-rolling mills are today's most up-to-date models. Their automatic "close tolerance" controls, operating under constant, sharp surveillance of highly skilled machinists, produce fine texture foil of minutely accurate thickness and uniform quality.

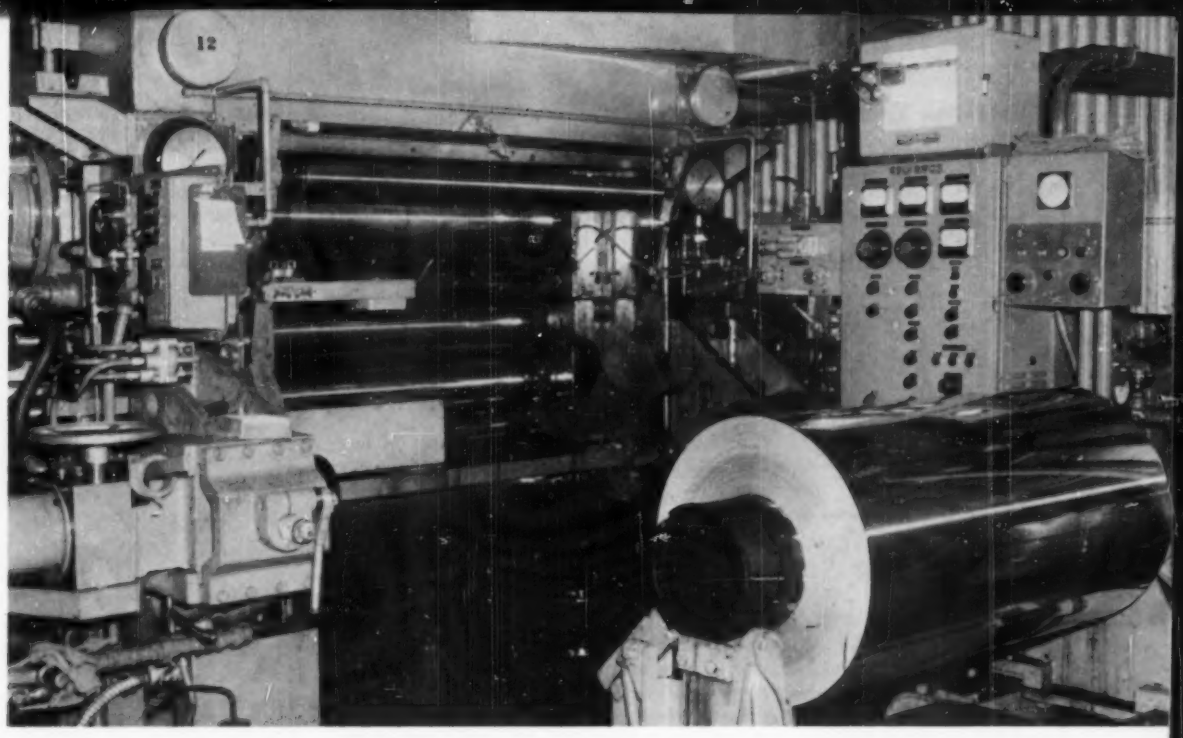
During the latter months of 1959, responding to a request from customers for a wider aluminum foil, the Louisville Anaconda Aluminum plant was equipped with two new Pittsburgh 62" mills. Safety engineers to provide instant automatic fire extinguishing protection for the new mills, designed a "three-part" local application, high pressure carbon dioxide fire control system.

Independent System

Compactly located, the "three-part" engineered fire control system provides a separate, independently operated 10-cylinder system (complete with appropriately positioned "rate of rise in temperature



Taken at initial moment of system performance test. Photo shows how swiftly fire in vital sector would be smothered.



Vital part of Anaconda Aluminum's new 62" cold rolling mills. It is guarded by high pressure CO_2 fire control system.

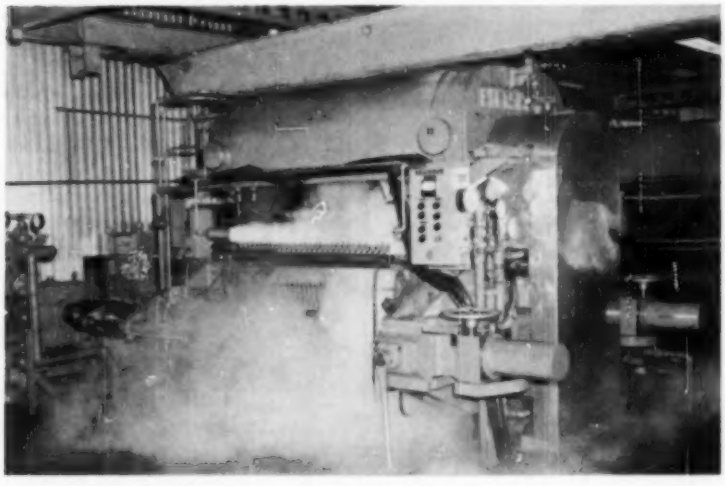
detectors" and exposure surrounding multi-discharge nozzles) for the total protection of each mill. A fire striking either mill will cause 5 of the 75-lb. capacity CO_2 cylinders (or "main cylinder bank") to discharge immediately. Should a second shot of carbon dioxide be needed to halt the fire threat, the 5 "standby" cylinders of CO_2 are switched into the system manually.

A third 12-cylinder system of similar design and operational features guards a large coolant tank and pit serving and situated directly beneath both new mills. This system—with a 12-unit bank of 6 "main" and 6 "standby" 75-lb. capacity CO_2 cylinders—has a 30-second time delay. When the system is actuated, discharge of carbon dioxide is automatically held back for a half minute, allowing time for personnel who may be working in the pit area to evacuate. A horn, audible above all machine noise in the vicinity, sounds the half-minute evacuation warning.

Each system is connected with a remote manual pull-box so that it can be actuated mechanically as well as automatically.

When one of the three systems is actuated—power to the mills and other department equipment is automatically shut-off; an audible fire warning is sounded over the entire plant and a colored light flashes notifying plant protection of the exact location of the fire emergency.

BELOW—Carbon dioxide fog clearing following test. Discharge nozzles are at front, back, both sides of mill exposures.



Comprehensive Program

Proceeding on a complete tour of the large Louisville foil-processing and office facility, it becomes quite apparent that Anaconda Aluminum employs a most comprehensive fire safety program. "On Duty" before the new systems were installed, dry chemical, vaporizing liquid and water portable extinquishers and larger wheeled-engine dry chemical extinguishers are located at close intervals throughout the whole of the plant.

Pictures by courtesy of Fyr-Fyter Co.

Fire Detection Vital
(from page 45)

pressure on both sides of the bellows, forces it closed. This completes an electrical circuit and sounds an alarm.

In the fixed temperature method, each detector has a bi-metallic strip. As heat rises, the strip bends in proportion to the temperature. At its pre-set temperature the strip bends sufficiently to complete an electrical circuit which sounds an alarm. (Another type of detector combines fixed temperature and rate-of-temperature-rise; either occurrence completes the circuit.)

Another system in sequence draws air samples from protected areas and scans them for smoke by means of a photo-electric cell.

Still another technique employs the flicker of flame acting on a "viewing eye" to trigger the alarm. Fusible links which melt at a set temperature are used too.

The cost of Underwriters' Laboratories and Factory Mutual approved equipment is modest, particularly when compared to the value of the property it is guarding. Maintenance is easy too. Best of all, in some cases fire insurance rates will be cut upon installation of an approved system.

To conclude, the need for prompt discovery and reporting of fire is a must if our huge annual fire loss is to be cut. The cost is small, the protection is vital.

Readers desiring further information on any of these approved fire detection systems can address their inquiries to the Editors.

'59 Worst Year . . . Yet

Fire left a $1.4 billion trail of destruction across the nation in 1959, the National Fire Protection Association reports. With the 11,300 deaths by fire reported earlier by the international fire safety organization, the overall 1959 fire record added up to the worst in history.

Compared with the previous year, the value of property destroyed increased by a staggering $160 million.

While approximately $106,500,000 of this increase was due to a U. S. Forest Service change in the method of calculating forest fire losses, the cost of all other destruction—in buildings, aircraft and motor vehicles—reached a new high.

The number of fires jumped by more than 120,000 to a total of almost 2,115,000. This figure has been matched or exceeded only once when in 1950 approximately 2,400,000 fires were reported in the National Fire Protection Association's annual estimates of fires and fire losses.

American homes were struck by fire at the rate of more than 10,000 weekly. The total of 542,000 dwellings damaged or destroyed showed a decline of about 16,000 from 1958. But the cost to homeowners went up $3 million in 1959 to a figure of $312 million, a record high.

The 1959 dollar loss in buildings of all types—from churches and schools to industrial plants and commercial buildings—reached a total of more than $1,083,000,000 in 883,300 fires. This was an increase of about 16,000 in number and nearly $27,000,000 in cost.

Fire cost industry close to $184 million in 1959, up about $1,300,000 from 1958. Losses in stores and other mercantile buildings rose about $6 million to a total of more than $101 million.

For the second year in a row schools and colleges improved their fire record. The dollar cost of 3,800 fires was a decrease of over 15 percent compared with 1958, but the total of damage and destruction still came to more than $20 million.

There were more than 1,230,000 fires last year not involving buildings—principally aircraft, motor vehicles, forest, ship, rubbish and grass fires—which accounted for an estimated loss of over $356 million.

What causes these destructive fires?

Topping the list of building fire causes is defective or overheated cooking and heating equipment, the

(Continued on page 52)

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Junkin Stretcher cases provide a compact convenient place for storing the army type stretcher, blanket and first aid equipment. Protects from dirt and grime — saves valuable space. Available as kit or case only.

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JUNKIN SAFETY APPLIANCES

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(For details, use Key # Z-14 on card on page 1)

New Electronic Fire Detector

Gas discharged electronic tube for fire detection is smaller than a golf ball, as can be observed in picture shown above.

An electronic tube, capable of detecting fire by sensing its ultraviolet radiation, has recently been developed. The tube—smaller than a golf ball—is insensitive to direct sunlight, normal illumination enclosed in glass, cosmic and nuclear radiation.

It was developed for use as a fire detector to provide a nearly instantaneous alarm, or in flame-out applications for the detection of absence of flames in boiler fire boxes, furnaces and other combustion chambers. It is the result of seven years of research.

As a fire detector, it offers several advantages over systems currently in use. With a sprinkler, a fire is usually well under way before it activates the sprinkler valve. In many areas, such as in department stores, resulting water damage is generally greater than that of a fire detected as soon as it starts.

Thermostatic controls react in a similar way. In most cases, temperature must reach a certain degree before an alarm is sounded, and the fire often has a good head start by then.

Sets Off Alarm

As a flame-out detector, the tube can be mounted at a small opening of any fire box. When a fire goes out, the tube, in a reaction opposite to that of fire detection, ceases to provide an output current, which action also sets off an alarm or operates controls. In either application, the tube can send its signal to a visual or audio alarm at a central, manned location, or in the case of fire detection, directly to a fire station.*

The tube has other applications than that of fire detection. It can be used as a communications device to pick up invisible ultraviolet ray signals, to detect gas and smoke and the density of liquids or air. It is operative within an ambient temperature range of —75°F to 400°F.

Here candle activates the detector tube, sensitive to ultraviolet radiations, in flame. Red warning light is illuminated.

The detector is one-and-one-eighth inches in diameter and one-and-one-quarter inches long, including mounting pins which fit an ordinary radio tube socket. It is an alternating current operated, gas-discharge device with two symmetrical electrodes. Ultraviolet radiation from flames, containing wave lengths of between 1900 and 2900 angstroms release electrons from the negative electrode.

How It Works

An electron emitted at an instant when the voltage across the electrodes is high, starts ionization of the gas which builds up to an avalanche of current that continues to flow between the electrodes during that particular half cycle. The circuit is normally arranged so that it does not respond to occasional half cycle pulses of current that might be initiated by extraneous sources, but rather to the greater average current set up by a series of pulses produced by the ultraviolet light source.

* Interested readers can obtain the name of the fire detector and the address for further information about the product upon inquiring to the Editors.

Pictures by courtesy of Thomas A. Edison Industries' Instrument Division.

Some Applications for the Ultraviolet Radiation Detector:

As a flame-out detector:
In boiler fire boxes, furnaces, ovens, kilns, etc.

As a fire detector:
In stores, warehouses, chemical plants, refineries, aircraft, power substations, fur storage vaults, etc.

As a communications device:
Ship to ship or man to man signaling.

As a remote control device, blind to sunlight:
To operate garage doors, etc.

As a smoke detector:
In warehouses, fur storage vaults, cargo ships, boiler and furnace stacks, ventilating ducts, etc.

As an electrical arc detector:
Generators, motors, switchgear, welding controls, etc.

Slippery Walkways

(from page 13)

showed useful life of all the materials to be only about three months in the rip saw section, beside two other saws, and alongside a conveyor line.

Although the danger areas were made comparatively safe through use of these materials, Mr. Maxwell believed there was room for improvement. Among other things, he was disappointed with the short life span of the non-skid surfaces. He pointed out that new applications had to be made every three or four months.

With this in mind, he tried the two-coat non-skid surfacing compound impregnated with grit particles more than a year ago. The compound like the one on the Bay City ramps, is still providing a serviceable, safe standing and walking area around the rip saw. Fast drying of the non-slip material greatly reduced machine downtime.

Employee reaction to the grit bonding compound is that the material is "superior" to the others that were replaced after a few months' service.

The area around the rip saw measures 32 square feet. (See Figure 4.) Although it is the only section on which the compound is now employed, Maintenance Supervisor Maxwell plans to use the non-skid surfacing material on a 100-square foot concrete ramp in the near future. In addition, the compound will replace other paint-like mixes beside the two other saws and along the conveyor line.

Slip-Proofed Stairs

Seeking to eliminate slips and falls on a heavily used metal stairway, the Portsmouth, N. H., Fire Department found its answer in a multi-purpose non-skid surfacing material that also proved effective in many other applications.

The material—applied first on the circular metal stairway, in January 1960—has also been used to provide safer footing on various pumper truck surfaces, and even to paint a rest room floor area.

"Safer footing is one of the big features for us," according to Fire Chief Frederick R. Crompton. However, there have been two bonuses. The compound has reduced maintenance problems and generated an air of greater confidence among the men, both in the station house and on fire duty.

Chief Crompton said he became interested in a non-skid material of this type when two of his men slipped and injured themselves on the metal stairway. "The fellows were using these back steps to and from their quarters more often than they were using the wooden stairway in the front of the building," he said.

Worn and Slippery

As a result, front edges of the steps were becoming worn and slippery—and dangerous, even with a hand railing.

5. The non-slip resurfacing compound has been applied to tail board of fire department pumper truck as protection for firemen against slipping and falling.

6. Security for firemen is also provided on this ladder truck turntable by application of abrasive surface coating.

He said one of the firemen—Jack Benjamin—applied the non-slip compound. He wire-brushed the steps clean and then used a zinc chromate base. The first coat of bonding compound was applied and then the abrasive particles were sprinkled on the steps. After an hour of drying time, excess grit was swept off and the second coat of bonding mix applied and allowed to dry for six hours.

"It was important to have a fast-drying preparation," according to the chief, "because we couldn't have those steps 'out' for a long period of time."

The stairway application led to suggestions from some of the firemen that it be used on pumper running boards. The compound, tried on one of the pumpers, was so successful that they followed through with the other units and was also applied to the turntable of the ladder truck. (See Figures 5–6.)

Another trouble area on the ladder truck—metal brake, clutch, and gas pedals—was eliminated with application of the same surfacing material. Fireman Tom Kelly, whose feet have slipped from these pedals, suggested the material would reduce this danger during rain and snow-ice periods, regardless of whether leather or rubber footwear was being used.

Summing up, Chief Crompton said, "it makes a big difference when you're hopping on and off, and operating on a truck if you can be sure of your footing. The men seem more confident now, more relaxed."

Washroom Application

Material from the same two-gallon kit also proved valuable in the station's rest room area where a concrete flooring below wash basins had been given as many as three coats of paint and still peeled. Although the compound has proved useful in preventing slips and falls in this wet area, its main purpose was simply to provide a hard surface.

Pictures by courtesy of Mine Safety Appliances Co.

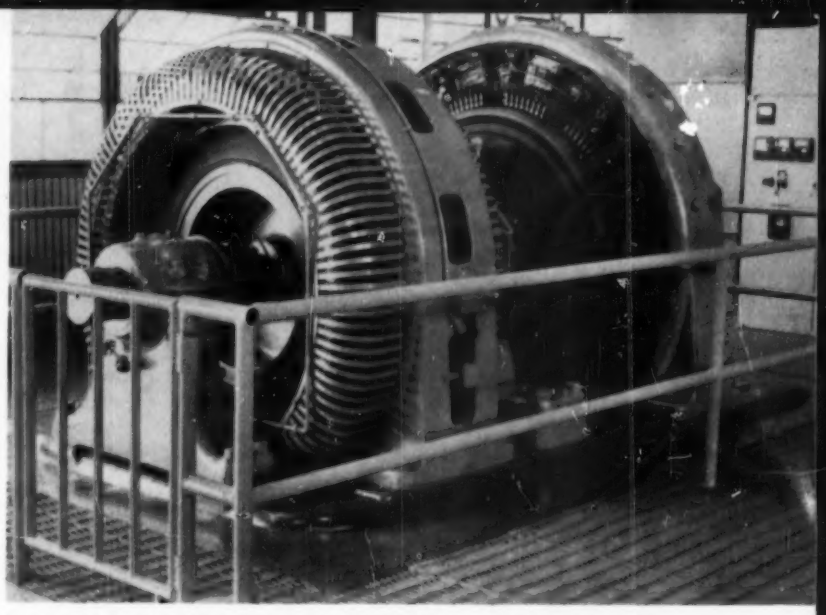


Fig. 1: Vital motor generators are fire-protected by carbon dioxide system.

Generator Fire Generates Extinguishment

Automatic carbon dioxide fire protection systems have become The Timken Roller Bearing Company's first line of defense against fire. Systems have been installed in all the company's plants in the United States and have proved successful in emergencies.

One of these systems was recently put in service at a new substation at the company's Gambrinus tube mill just outside of Canton, Ohio. Equipment and installation costs were not prohibitive for it buys automatic protection for three motor generator sets which service all facilities at the Gambrinus plant.

After the equipment was installed, engineers of the fire equipment manufacturer conducted an acceptance test at the substation for the factory insurance association that underwrites the Timken Company for fire insurance.

One of the three motor generators was heated to a predetermined temperature, setting off actuators which automatically tripped the releasing mechanism. This in turn discharged the cylinders and allowed the gas to come through the generator.

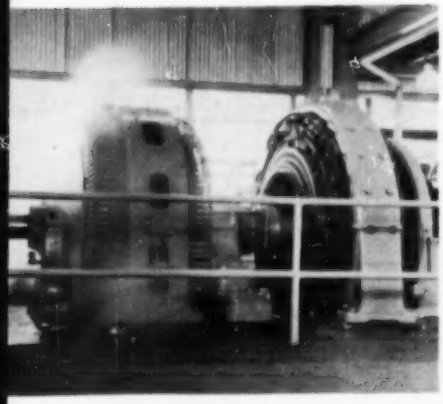


Fig. 2: Test run of the automatic fire extinguishing system for the generators.

This system works by replacing the oxygen which is surrounding the generator or the motor, whichever is on fire, with carbon dioxide. This displaces the oxygen and cools and smothers the fire simultaneously.

The gas, a colorless substance, was visible only during its immediate emergence from the end of the nozzle. The gas discharge occurred all during the run-down time of the generator and for about ten minutes after it had stopped.

The discharge lasted approximately 20 minutes which is in accordance with the National Board of Fire Underwriters specifications. The generator's run-down time was nine and one-half minutes.

After the test was completed, as would be the case in event of a real fire, the system was automatically reset for another operation.

There are sixty 50-pound cylin-

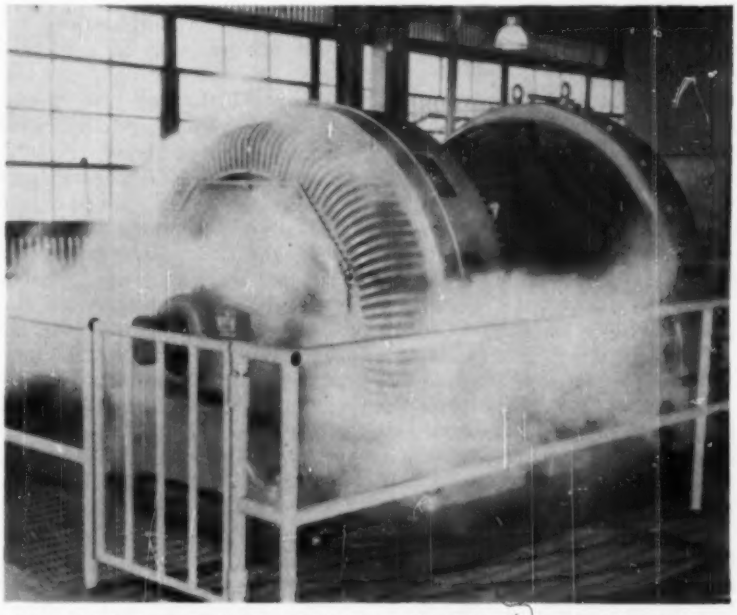


Fig. 3: System automatically expels the extinguishing gas cloud through the complete run-down cycle of the generator and for 10 minutes thereafter.

ders of carbon dioxide set up in two separate batteries. Thirty are used in the initial discharge and a reserve of thirty are in readiness in case it is needed.

They are operated through selector valves which automatically concentrate the flow of CO_2 on the unit involved.

Company Fire Captain Vernon C. Price said that the equipment offers the utmost in positive fire protection. Equally important, he feels, there is no damage factor to equipment involved in extinguishing the fire or in testing the fire system. There is no foam or water to damage motors and no clutter to clean up after the discharge. The gas that is not dissipated in the air is forced down through floor vents into the basement where it is removed by a precipitron.

The system is particularly practical for protecting an area where finished products are manufactured or stored. Should a fire occur, the carbon dioxide discharge would not rust, corrode or otherwise damage the products as would be the case if other systems were employed.

Pictures by courtesy of The Timken Roller Bearing Co. and American La France Corp.

'59 Worst Year

(from page 48)

National Fire Protection Association reports. They were responsible for starting an estimated 202,000 fires in 1959, at a cost of $137,760,000 in damages.

Second principal cause is careless smoking and disposal of matches, which started 159,300 fires destroying $75,560,000 worth of buildings.

Defective or improperly used electrical wiring and equipment caused 122,900 fires, with losses totalling $193,220,000.

Rubbish provided a starting point and fuel for 57,000 fires which cost $21,000,000.

Among the many other causes appearing on the NFPA list is the risky combination of children and matches, which set off 34,600 fires last year responsible for a total of $22,380,000 in losses.

Compiling the National Fire Protection Association's annual study of fires and fire losses is a complex task which requires nine months to assemble data and make calculations. The organization's Fire Record Department prepares the estimate from reports submitted by federal, state and local fire authorities, as well as from industrial and other sources concerned with fire. Covering uninsured as well as insured losses, the NFPA report is rated the most complete and accurate of its kind.

Reprints of the complete report of "Fire and Fire Losses Classified, 1959" are available from NFPA Publications Department, 60 Batterymarch Street, Boston 10, Mass., at 25 cents a copy.

Fire Hose

An important new NFPA standard for all fire departments is No. 196, on the subject of fire hose. It provides basic performance specifications to be used for purchasing woven-jacketed rubber-lined fire hose of single- or multiple-jacket construction.

The requirements of NFPA Standard No. 196 apply to the trade sizes of 1, 1½ and 2½ inch single- or multiple-jacket, 3 and 3½ inch multiple-jacket rubberlined fire hose.

The publication includes sections on examination of hose for compliance, hose construction, diameter and length, hydrostatic pressure tests, mildew resistance and marking. An explanatory appendix covers items of particular importance for municipal fire departments developing hose specifications, as well as definitions of working pressure, proof pressure, burst pressure and the pressures for a kink test.

The standard, adopted at the National Fire Protection Association's 1960 annual meeting, was prepared by the NFPA Committee on Fire Hose under the chairmanship of Chief A. W. Kimball of the Hingham (Mass.) Fire Department. It was submitted to the NFPA Committee on Fire Department Equipment, chairmanned by Henry G. Thomas, retired chief of the Hartford (Conn.) Fire Department.

Copies of the new standard (NFPA No. 196, 16 pages, 40 cents a copy) are available from the National Fire Protection Association, 60 Batterymarch Street, Boston 10.

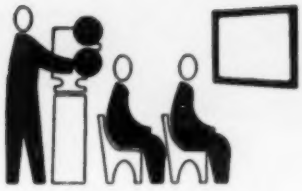
Matson Retires from UL

A. F. Matson, Managing Engineer, Chemical Department of Underwriters' Laboratories, has retired after 41 years, all of which was spent in the Chemical Dept. E. N. Davis will take over his job as Managing Engineer of the Chemical Dept. Claude Bawden, UL inspector at Columbus, Ohio, retires after 28 years in the Label Service Dept.

Mr. Matson was born and raised in Vermillion, S. D. and graduated from the University of South Dakota in 1919 with a B.A. degree in Chemistry. He joined the UL staff in October, 1919 as Assistant Chemical Engineer. Working up through the ranks, he was made head of the Chemical Dept. in 1946. He is a registered professional engineer in Illinois and California. He was very active on many NFPA and IAEI committees, particularly those having to do with hazardous locations. He was also a member of several committees on ASTM, ASA, American Chemical Society and U. S. Advisory Committee. He was author or co-author of ten different articles or bulletins of research.

Mr. Davis graduated from the University of Illinois in 1933 with a B.S. degree in Chemical Engineering. He received his M.S. degree in Chemistry in 1941. He joined the staff of UL in 1937 as a Rubber Research Chemist. In 1954 he was promoted to Managing Engineer, Inspection Control Dept., the department now being combined with the Chemical Dept. He is active on several ASA, ASTM and NFPA committees with particular reference to insulated wires and cables and rubber-lined fire hose.

Mr. Bawden, Columbus Supervising Inspector for Underwriters Laboratories, Inc. retired on October 31 after 28 years of service. He began his career within the area of public safety in 1920 with the Ohio Inspection Bureau. Most of his time with the Bureau was spent doing UL inspections. In 1932 he officially joined Underwriters' Laboratories as an inspector, in 1950 assumed the duties of Senior Inspector for the Columbus area, and in 1953 was promoted to Supervising Inspector.



Safety on Film

Donald Duck Joins Safety Team!

Walt Disney's belief of long standing that humor is a quick way to the mind is ably demonstrated in the new eight minute Technicolor short, "How to Have an Accident at Work" now released in 16mm for use by business and industrial organizations.

This sharply drawn satire of the industrial safety problem is a shining example of Disney's unique method of treating serious subjects of public interest in terms of infectious comedy.

Mr. Average Man

Donald Duck, long famed as the symbol of the irrepressible average man, is a model of good safety habits at home but recklessly disregards all the rules when he goes on the job. As he makes his repeated trips to the first aid station he blandly blames fate for his troubles. J. J. Fate materializes as a beared duck character and shatters Donald's efforts to alibi his own thoughtlessness.

No newcomer to the safety field, Donald Duck previously served with merit as the star of an earlier Disney film, "How to Have an Accident In the Home."

16mm color prints are available for daily rental or under long term lease from the 16mm Film Division, Walt Disney Productions, Burbank, California.

Chemical Safety Films

Four new educational safety films, each dealing with the proper handling of a common industrial chemical, are now available from The Dow Chemical Company.

The film titles are: "Handling Caustic Soda Safely," "Handling Chlorine Safely," "Handling Chlorinated Solvents Safely," and "Handling Muriatic Acid Safely."

Designed for Training

Each is a 35mm four-color sound slide film running approximately 12 minutes. The films are designed for use in the training of employees who work in industries which utilize the chemicals in their operations. Each film explains the nature of the chemical involved, points out the hazards of the material, and then gives a step-by-step procedure on the proper methods and techniques that should be followed when working with the chemical.

Information in the films is based on Dow's experience as a long-time producer of the chemicals, as well as on the latest recommendations of the Manufacturing Chemists' Association.

The films are available free-of-charge on a "loan out" basis through any Dow Sales Office and from the Public Relations Department, The Dow Chemical Company, 690 Building, Midland, Michigan.

Safe Driving Film

"Stop Driving us Crazy," a new animated driver education film that appeals to teenagers and adults on ethical and moral grounds, is being distributed by Association Films. The 10-minute color film is unlike any other safety appeal made previously in that it avoids slogans, warnings and "death on the highway" shock treatment.

The film, which has won the hearty endorsement of the President's Committee for Traffic Safety and the National Safety Council, features the voice of TV comic Howard Morris, abstract drawings, and a special jazz score played by Art Blakely and the Jazz Messengers.

It was produced by Creative Arts Studio for the General Board of Christian Social Concerns of the Methodist Church. "Stop Driving us Crazy" is the story of "Rusty," a four-wheeled creature from Mars, who is captured by a "two-legged" earth creature and learns to his dismay that envy and pride have replaced simple Christian courtesy on the road.

How to Get Film

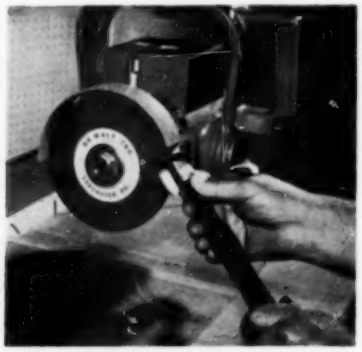
The film is available on a rental basis at $6.00 per booking and purchase at $125. Requests should be sent to Association Films, Inc., 347 Madison Avenue, New York 17, New York.

For list of
16mm sound
SAFETY FILMS
write or telephone

INTERNATIONAL FILM BUREAU
INC.
332 S. Michigan Ave.
Chicago 4, Ill.
HA 7 4546

(For details, use Key # Z-18 on card on page 1)

KEEPING UP WITH



SAFETY KIT FOR POWER TOOLS

A safety kit consisting of two guards—one for straight grinding, buffing, and wire wheels up to 6-inch diameter, and one for cup wheels up to 4-inch diameter—has been designed by DeWalt Division of American Machine and Foundry Co. for use with radial-arm units in which the saw blade has been removed and a wheel attached. The guards fit over the wheel, and are clamped to the motor end bell by using the motor stud and wing nut. Adjustment, to assure placement at the safest angle of use, is made by loosening three screws on the guard bracket. A complete kit consists of one guard bracket, two guard shrouds, one tool rest assembly, and necessary hardware.

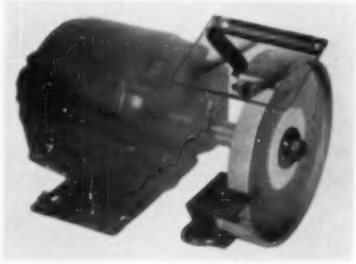
For details, use **Key # MG-1** on inquiry card on page 1.

OVERSPEED SAFETY DEVICE FOR PNEUMATIC GRINDERS

A new safety device made by Thomas C. Wilson, Inc., and incorporated in all their pneumatic grinders with rated speeds of 7200 rpm or less, supplements the governor which normally controls wheel speed. If the governor becomes inoperative for any reason, such as improper adjustment or dirty air, the device functions to protect personnel from dangerous wheel speeds. It is not needed on grinders with rated speeds above 7200 rpm, since their free speeds are safely below wheel proof speeds.

The mechanism has a simple positive snap action which cuts off air to the motor before safe speeds are exceeded. Air remains off until the device is reset. This requires removal of the throttle handle, which provides access to the governor. This provision guards against keeping a grinder in service without restoring the governor to normal operation.

For details, use **Key # MG-2** on inquiry card on page 1.



GRINDING WHEEL GUARD

A guard for a bench grinder, which incorporates an adjustable eye shield with an adjustable tool rest, has been developed by Appliance Engineering Co. Known as the Grinder Ga-R-est, the device mounts independently on any fractional horsepower motor used in conjunction with the standard motor arbors on which a 6″ grinding wheel is mounted. The unit is designed to safeguard users of less expensive grinding equipment, which does not have built-in protection.

For details, use **Key # MG-3** on inquiry card on page 1.

MACHINE GUARD DEVELOPMENTS

PRESS SAFETY BLOCK WITH CUT-OFF FEATURE

Shock-resisting magnesium safety blocks, designed to provide maximum safety in metal working press operations, are being offered by Magline, Inc. Constructed of lightweight magnesium alloy for easy handling and dependable strength, the new line of blocks are available in six standard section sizes and are capacity-rated to ultimate load requirements in any specified length. A feature of the new line is the recommended safety power cut-off. When safety block is removed from its controlled storage position for installation in press, power is automatically cut off, providing required safety to worker and equipment.

For details, use **Key # MG-4** on inquiry card on page 1.

SAFETY GUARD INSERT FOR GRINDING WHEELS

Greatly increased safety in the use of angle portable grinders is accomplished with the use of a new Safety Guard Insert, claims the manufacturer, Carroll Pressed Metal, Inc. Without sacrificing any of the grinding surface, the built-in guard locks in the wheel between the extruded prongs and the outside guard, and between the prongs and the center nut. The company claims the grinding wheels mounted with this unit are 25% to 40% safer to use than those equipped with separate conventional protection. Safety Guard Insert is also said to eliminate the need of reinforcing rings, pronged anchor bushings, and individual mounting nuts.

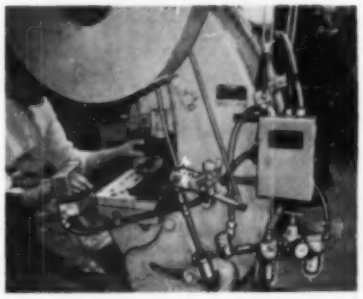
For details, use **Key # MG-5** on inquiry card on page 1.

VACUUM LIFTER FOR PUNCH PRESS

A vacuum lifter for feeding and removing work from punch presses is available from Safety Vacuum Lifter Co. Unit lifts and holds parts securely, releasing instantly with a light touch upon the thumb lever, and permitting the operator to work without placing his hands under punch press ram. The lifter is also used for transferring sheets and parts from piles or stacks. It protects hands from contact with burrs and sharp edges, and keeps soil and perspiration from marking highly polished and finely finished surfaces.

Length of handle is 15″; cup diameters are 1½″, 2½″ and 4″. There is no metal on the inside of cup to mar the surface of material or parts being handled. Designed for all non-porous materials, such as metal, plastic, fibre, glass, tile, linoleum, etc.

For details, use **Key # MG-6** on inquiry card on page 1.



POWER PRESS CONTROL

A combination two-hand electric control with timer and an automation control has been announced by Searjeant Metal Products Co. The control box automates certain stamping and punching operations. Used as a two-hand control, the circuit is designed so that both palm buttons must be pushed within a pre-determined time, making it impossible for an operator to tie down one button and trip the machine with the remaining button, even for the first stroke.

Actuating switches may be attached to certain dies and plugged into control box in place of the palm buttons. The stock will automatically actuate the switch and trip the press only when it is in correct position. This avoids spoilage and results in an estimated increase in production of as much as 30%.

For details, use **Key # MG-7** on inquiry card on page 1.

METAL PARTITION GUARDS

Expanded metal partitioning and panels have been added to its line by the Products Division of Globe Co. The Safe-Gard partition, featuring Quik-Erect patented fittings, is designed to guard conveyors, machines, and other plant hazards, as well as for general applications. The interchangeable panels are shipped ready for erection, with no cutting, drilling or welding required.

For details, use **Key # MG-8** on inquiry card on page 1.

FILTER BOWL GUARDS

New guards for plastic bowls on Crown Filters and Lubricators have been announced by Hannifin Co. These guards are made available for those who want to retain as much as possible of the visibility advantage of transparent bowls while affording maximum protection against personnel injury in the event of bowl breakage due to physical damage or chemical attack to the plastic.

Units are manufactured from heavy gauge perforated steel that provides maximum safety together with excellent visibility. "Magnification effect" clearly shows the liquid level in the bowls at all times. Because the guard is an integral part of the bowl retaining ring, it cannot be left off if ever removed for any reason.

For details, use **Key # MG-9** on inquiry card on page 1.

DIE PROTECTORS PREVENT DOUBLE HEADING DAMAGE

A complete line of electronic die protectors for punch presses has been introduced by The Clark Controller Co. Die damage due to double heading is prevented by allowing the press to recycle only if a part is ejected from the previous cycle. The devices can also be used to count parts.

These electronic protectors for any size automatic or manually fed press can be used with any type of electrically operated clutch, provided that in normal operation the part reaches the pickup at an instant when it is still possible to stop the next press stroke. Mechanical clutch presses can also be adapted for use with these die protectors by the addition of air cylinder or solenoid operators.

Available in photoelectric, impact, and RF coil types, the units will detect parts made in any shape, of any material, as well as parts ejection at high speed.

For details, use **Key # MG-10** on inquiry card on page 1.

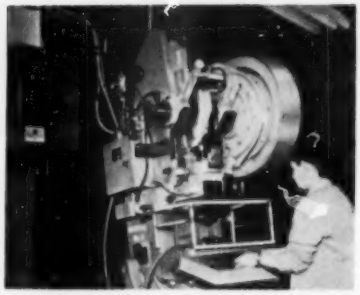
MAGNETIC BASE LAMP FOR PRESS ILLUMINATION

Pin-point lighting of the die opening of a press can be accomplished through use of a magnetic base light, such as is manufactured by Standard Portable Cord Co. The base holds the lamp anywhere on the press; a swivel clamp permits positioning for best possible illumination. When properly set, the press opening is completely delineated, and the operator can easily see if the die opening is clear and the press ready to operate.

For details, use **Key # MG-11** on inquiry card on page 1.

ELECTRONIC CONTROL GUARD

Model 500-1B Electronic Safety Control provides instant protection of machine operators without contact, reports the manufacturer, Security Controls, Inc. The work area is fully accessible and unobstructed, a particularly important feature for stamping, embossing, cutting and creasing presses, eccentric slotters, rolls, etc. Components are a sensing element or antenna, connected by a coaxial cable to a key-locked, shock-mounted, gasketed enclosure. The element is a conductive conduit which is



easily shaped to the desired boundaries of the restricted area, without hindering production or feeding operations. It is mounted on the machine with special insulator blocks.

An invisible, radio-like field, of adjustable proportions, is set up around the dangerous work zone. A hand, a tool, or other undesirable object entering the forbidden area instantly actuates a relay in the control cabinet, bringing the machine to an immediate stop. Operation will not resume until the object is removed. Where desirable and safe, the field can be nullified during the machine's upstroke, through use of a cam limit switch. Power failure, disconnect, or faulty operation of the control, drops out the master relay, stopping the machine instantly.

For details, use **Key # MG-12** on inquiry card on page 1.

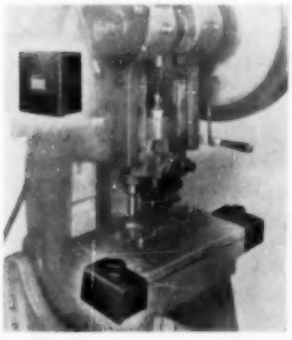
NEW LOCKOUT SWITCH

A new safety switch called Pow-R-Off, which will prevent injuries to machine operators and avoid damage to costly machines, is being marketed by H B Research & Development Co. The device may be attached to any machine tool which uses a key-operated chuck—such as an ordinary drill press—and,

during the make-ready, locks off the flow of electric current while the chuck key is in use.

The chuck key is permanently attached to a cable which is spring-wound on a drum. When the key is pulled out for use, a switch is tripped, shutting off the current. When key is no longer in use, the cable is retracted onto the drum by the spring action, and the switch turns the current on again. The switch can be easily installed in a few minutes.

For details, use **Key # MG-13** on inquiry card on page 1.



TWO HAND PRESS CONTROL

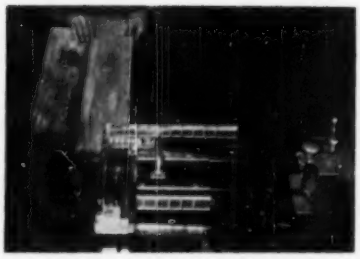
A sturdy, electro-magnetic two-hand push button press control, designed specifically to keep both hands of the operator safely away from the stroke of the power press ram, has been announced by Durant Tool Co. The new Ambi-Trip will energize the solenoid of a press-clutch only if both buttons are simultaneously pressed. No stroke is possible if either push button is tied or held down.

A self-contained unit that can be set to operate a single-stroke or continuous press, it requires no external cams or switches and employs a unique design of trouble-free power relays. When switch is off, the buttons will not trip the press.

For details, use **Key # MG-14** on inquiry card on page 1.

DOUBLE ARBOR SAW GUARD

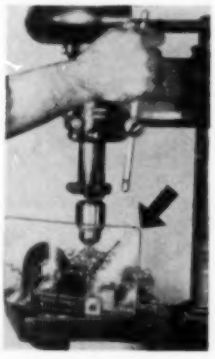
Application of the Brett-Guard Safety Guard and Saw Production tool to saws equipped with double, as well as single arbors, is accomplished by use of a custom fabri-



cated, special extension plate. This plate is equipped with a sub-base which is tongued and grooved. The sub-base is provided with lock screws which permit it to be located in any position parallel to the saw arbor, as the arbor line is changed by changing the position of the blade, and firmly locked in that position.

This extension plate, as pictured in U. S. Army photograph, provides quick and easy back and forth adjustment of the entire guard to accommodate similar movement of the arbor as saw is raised or lowered to a different position. The Brett-Guard control housing need not be removed when blade position is changed, but only moved intact into the new position.

For details, use **Key # MG-15** on inquiry card on page 1.



MAGNETIC SAFETY SHIELD

An inexpensive portable safety shield to protect operators of drill presses, lathes, milling machines and grinders, etc., is available from Better Specialties, Inc. Attached to the lower edge of the shield are two permanent ceramic magnets mounted by single eyelets, slightly off center. This permits a swiveling action, so that the shield may conform to any arc-like spot on a machine, and is mountable vertically, horizontally, or at any angle. Its transparency permits work to proceed unimpeded, while safeguarding the operator's eyes, face, hands and arms from bombardment by hot shavings, chips, etc.

For details, use **Key # MG-16** on inquiry card on page 1.

Maintenance Conference

(from page 16)

weeks in advance, problems they would like to hear discussed. The 11 types of plants to which separate sessions will be devoted are automobile, chemical processing, electronic equipment manufacturing, textiles, cement, metal-working and metal-fabricating, paper, petroleum processing, food processing, research and development, and steel.

Preventive maintenance and work sampling are stressed among the technical topics. Three sessions will be devoted to electrical problems. They are "Upkeep of Electronic and Other Control Instruments," "Planning Maintenance for Automatic and Static Machine Control" and "Keeping Ahead of Power System Problems."

Other technical subjects include "Welding in Maintenance," "Accounting for Maintenance Costs," "Getting the Most Out of Industrial Trucks and Batteries," "New Materials and Products for Maintenance," "Keeping Contamination Out of Air and Water" and "Keeping Yards and Grounds the Way They Ought To Be."

Among the important managerial questions to be considered, besides those listed for the major sessions, are "Scope of the Plant Engineering Function," "The Plant Engineer's Responsibility for Building Design and Construction," "The Pros and Cons of Outside Contracting," "Training Maintenance Employees," "Plant Engineering in the Small Plant," "Controlling Costs by Correct Planning and Scheduling," "Incentives and Work Measurement in Plant Maintenance" and "Plant Engineering Responsibility in Plant Start-Ups."

Information about conference registration, instructions for sending advance "problems" to "problem sessions," rapid registration cards for the show and hotel information may be obtained by writing Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Learning The Hard Way

SUFFOCATED

A workman was feeding copra into crushers from a large bin. He was alone at the time, and to check the level of the copra, he stepped into the bin. The copra gave way under his weight and he was buried alive in it. The workman should have been wearing a safety belt with a life line and he should not have attempted to enter the bin unless someone else was there.

TIME SAVED . . . OR LOST?

Foremen are supposed to guide those under them in accident prevention and set them a good safety example. But foremen, too, suffer from errors of safety judgment. For example, a foreman with nineteen years' experience, wanted to measure the clearance height of a fork lift truck with the lift in its fully extended position. Instead of taking the extra time to get a ladder for the job, the foreman stood on the forks and had the operator raise him as high as possible. When the forks were lowered, a failure in the regulation of the chain drive caused the forks to drop suddenly about six feet. The foreman lost his balance, and fell, receiving severe lacerations and bruises. It is a basic safety rule that truck operators should not allow personnel to stand or ride on their equipment. This accident also shows the importance of thorough maintenance of mechanical equipment.

OUT OF THE FRYING PAN . . .

At a building construction project some kettles of asphalt had been heating for several hours and finally overheated. To extinguish the resulting fire, workmen applied portable water extinguishers and a small hose stream. Addition of the water, however, merely caused the asphalt to boil over the sides and spread along the floor, eventually setting fire also to an asphalt supply tank. The fire department finally extinguished the blaze using fine water spray. Here is another example of trying to put out a fire with the wrong type of extinguisher, which in this case, and as so often happens, only makes matters worse. Dry chemical is a recommended extinguisher, of the portable type, for asphalt fires.

SAFETY . . . TOO LATE

A state safety inspector ordered a manufacturing firm to install point-of-operation guards and foot treadle guards on several of its power presses. The firm ordered the guards, which were scheduled for delivery in ten days. Five days before the guards were due, a press trainee tried to clear a piece stuck in a die. While doing so, he accidently stepped on the treadle, activating the press. He lost four fingers.

PORT-O-RUNG
U. S. Patent 2,945,549
Foreign Patents Pending
Auxiliary rungs to replace any rung, and any number of missing rungs, in all permanently installed upright ladders.
GAGNON ENTERPRISES
77 River Street, Hoboken, New Jersey
SWarthmore 2-0662

(For details, use Key # Z-15 on card on page 1)

Truck Driver Courses

Bulletins for the 1961 truck driver training schools at North Carolina State College are now available through the College Extension Division. The brochures describe the four-week training programs and give information about cost and application. The schedule of four-week courses is: Jan. 2–Jan. 27; Jan. 30–Feb. 24; Feb. 27–Mar. 24; Mar. 27–Apr. 21; Apr. 24–May 19; May 22–June 16; June 26–July 21; July 31–Aug. 25; Sept. 4–Sept. 29; Oct. 2–Oct. 27; Oct. 30–Nov. 24; Nov. 27–Dec. 22.

The truck driver training school, now in its 12th year of continuous operation, is conducted by the College Extension Division in cooperation with the N. C. Motor Carriers Association. For bulletins, write the College Extension Division, Box 5125, State College Station, Raleigh, N. C.

National Safety Congress

(from page 27)

Jones suggested that a logical place to start restoring the nation's sagging moral and social standards is behind the wheel of an automobile.

"I firmly believe," he said, "that in trying to prevent traffic accidents we are building a more efficient society, a better way of life and a greater nation. We are in fact, taking a step toward world peace.

"In overcoming the things that cause traffic accidents we are overcoming the things that cause war—things such as greed, selfishness, contempt for the law, disregard for the rights of others, failure to share."

inside the trade

Addition of three sales representatives and establishment of a new branch office in Fresno by the *COLUMBIA WAX CO.* has been announced by N. H. Farthing, General Sales Manager.

William Johnston, who will service the Southwest Los Angeles area, is well acquainted in the maintenance field, having represented a maintenance products firm in the Los Angeles area prior to his association with Columbia.

Harold Neilly, who is a graduate of the University of Western Ontario, was formerly associated with Bing Crosby Enterprises. He has been assigned to the Long Branch area.

Robert O'Sickey, who will staff the new Fresno branch, has had more than a decade of experience in industrial sales in the Los Angeles area.

Closely following the company's move to expanded quarters in a new structure at 2524 Fulgas Avenue, Palo Alto, *G. K. TURNER ASSOCIATES* has announced the appointment of *Donald B. Murray* as sales manager. He will devote his attention to dealer contracts and service for the company's line of anlytical fluorometers for medical and industrial laboratory application. He was formerly representative in the San Francisco area for the scientific instrument division of Bausch & Lomb Optical Co.

The appointment of *Power Items, Inc.*, 648 Liberty Avenue, Brooklyn 7, New York, as exclusive distributors of Tubar Materials Handling Equipment for the Metropolitan New York Area, has been announced by the manufacturers, *UHRDEN, INC.*, Dennison, Ohio.

A. M. Lowrey has been named Assistant Industrial Sales Manager, *Thermoid Division, H. K. PORTER COMPANY, INC.* Mr. Lowrey was formerly Eastern Regional Sales Manager for Thermoid. In his new position he will be responsible for the marketing and sales of industrial rubber products. Mr. Lowrey joined the Quaker Rubber Company in 1941 prior to its incorporation into H. K. Porter Company, Inc. He was promoted to Philadelphia District Manager in 1950 and in 1959 became Eastern Regional Sales Manager.

Lyle V. Martin was named Advertising Manager of the *Thermoid Division*. He will be responsible for the advertising of the entire Thermoid product line, which ranges from automotive brake linings, clutch facings and fan belts to large diameter industrial hosing, conveyor belting and asbestos textiles. Mr. Martin was formerly Advertising and Sales Promotion Manager for the Carter Carburetor Division of ACF Industries, Inc. at St. Louis, Missouri.

The appointment of *Richard E. Miller* as Product Line Manager for eye and face protection equipment has been announced by *MINE SAFETY APPLIANCES CO.* He will supervise sales of the company's new Sightgard line of spectacles, goggles, face shields, and similar products. He was a sales engineer with American Optical Company from 1950 to 1954; and sales manager for Pennsylvania Optical Company for six years before assuming his present position.

Appointment of *Edward W. Hufnagle* as manager of automotive sales for the glass division of *PITTSBURGH PLATE GLASS CO.* has been announced by Marvin W. Marshall, director of automotive glass sales. Mr. Hufnagle succeeds W. L. Tomlinson who died on September 30 (1960).

In his new capacity Mr. Hufnagle will supervise the automotive glass sales office in Detroit, Michigan, and will be responsible for glass division liaison operations with the automobile industry. Associated with Pittsburgh Plate since 1945, Mr. Hufnagle is widely-known throughout the automotive industry and is well-experienced in automotive glass development and engineering problems.

BOBRICK DISPENSERS, INC., leading New York and West Coast manufacturer of Soap Dispensing Equipment, recently announced the appointment of *Robert J. Wolf* as Architectural Representative. Mr. Wolf will detail prominent Architects and Engineers in the metropolitan Cleveland area and will service wholesale plumbing jobber accounts.

Weber Welding Co., Inc., of 5108 Liberty Avenue, Pittsburgh, Pa., has been appointed as exclusive distributor in Alleghany County, Pa., by the *GLENDALE OPTICAL CO.*, of Valley Stream, New York. Complete stocks of welding goggles, safety spectacles, plastic goggles,

BRANSON

Ultrasonics at work . . .

CORROSION SURVEYS and FLAW DETECTION

AUDIGAGE® 6 — the new miniaturized, self-powered "mighty midget" Thickness Gage and Flaw Detector. Ideal for corrosion surveys by one man in awkward locations. Weighs less than 5 pounds complete. Uses new high-sensitivity, high-resolution **Type Z** transducers, flat or curved, in various mounts for every application. Measures directly in inches between 0.09" and 5.0". **BULLETIN A-201.**

AUDIGAGE® 5 — the standard self-powered instrument for field corrosion surveys when greater range or accuracy than Model 6 are required. **BULLETIN A-2.**

VIDIGAGE® 14 — the high-accuracy, high-speed, ultra-sensitive gage with a 14" CR tube. Range 0.005" to 2.7" with accuracies to 1/10 of 1%. Interchangeable oscillators and direct-reading scales. Extension cables and intercom phones for remote testing up to one-fifth mile from the basic instrument. **BULLETIN V-200.**

SONORAY® 5—the new portable, high-performance pulse-echo Flaw Detector for testing weldments, shafts, plates, etc., and detecting other internal flaws. Only 37 lbs., 7½" x 11" x 20¼" long. **BULLETIN T-203.**

Send Coupon to **BRANSON INSTRUMENTS, INC.**
41 Brown House Road, Stamford, Connecticut

BRANSON: Send Bulletin **A-201, A-2, V-200, T-203.**

NAME_____

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(For details, use Key # Z-16 on card on page 1)

etc., will be maintained by the Weber organization for prompt supply to retailers, factories, utilities and other users of safety equipment.

The highly popular series of public service Fire Safety addresses currently being presented by *John S. Chapman, FYR-FYTER COMPANY* Educational Director, will be continued throughout 1961, the company has announced.

Industrial concerns, fire service and safety associations wishing to invite Mr. Chapman to appear as guest speaker on a 1961 program should, as early as possible, contact: J. L. McGarry, Customer Services Department, The Fyr-Fyter Company, 221 Crane St., Dayton 1, Ohio. Many invitations for the coming year have already been received and preliminary plans for Mr. Chapman's '61 itinerary are presently being developed.

C. E. Graham Reeves, President of the *FALCON ALARM CO., INC.*, of Summit, N. J., has announced that the company's automatic gas-operated fire alarms have been listed by the Underwriters' Laboratories of Canada, Inc., under their inspection service.

The Falcon Automatic Fire Alarms are not only the first gas powered units ever to be listed by the ULC but also are the first single station units (a term used to describe a self-powered alarm) of any type listed by the ULC.

Falcon Fire Protection of Scarborough, Ontario, is acting as manufacturer's representative throughout Canada. The appointment of stocking distributors throughout the Provinces as well as dealers in the principal cities of the Dominion is anticipated.

GOJER, INC., Akron, Ohio, has announced the re-design of the carton for its Go-Jo Heavy Duty Dispenser. Producers and packagers of a full line of handcleaning products in a wide range of container sizes, the company also manufactures the Heavy Duty Dispenser to accommodate the 4½ lb. can of Go-Jo Creme Hand Cleaner. Printed in red and blue on a gray tweed-like background, the Dispenser's new package was designed to achieve a clean, contemporary look of quality in keeping with that of the dispenser itself. The company's "Go-Jo" trademark has also undergone redesign, and is prominently featured in its new form.

Berton Karol, Manager of the *Automotive Division, OXY-CATALYST, INC.*, Berwyn, Pa., announces the appointment of the following as representatives for their line of exhaust purifiers for gasoline, LP Gas, and Diesel Powered industrial vehicles:

Plowden & Roberts, 3000 Devine St., Columbia, S. C.; *Territory Covered:* North Carolina, South Carolina, and Georgia.

Fred Hess, Jr., Albuquerque Material Handling Co., Albuquerque, N. M.; *Territory Covered:* New Mexico.

J. P. Fuller, Inc., Carter County Bank Bldg., Elizabethton, Tenn.; *Territory Covered:* Tennessee and Alabama.

Rittiner Equipment Co., 2200 Hancock St., Gretna, La.; *Territory Covered:* Louisiana and Arkansas.

Landes, Zachary & Peterson, 601 S. Jason St., Denver 23, Colo.; *Territory Covered:* Colorado, Utah, Wyoming, Nebraska, and Idaho.

Foster Equipment Co., 719 Ahua St., P. O. Box 2834, Honolulu 3, Hawaii; *Territory Covered:* Hawaii.

Crown Machinery Co., P. O. Box 444, Mount Vernon, Wash.; *Territory Covered:* Washington.

THE KORFUND CO., INC., specialists for more than 50 years in the manufacture of equipment for the measurement and control of noise, shock and vibration, has recently moved to a new, modern plant in Westbury, L. I., N. Y. The 34,000 square feet of factory and office space in the new building nearly doubles the facilities of the company's previous quarters in Long Island City, and provision is made for further expansion. The address of the new plant and offices is Cantiague Road, Westbury, L. I., N. Y., a location that, with newly completed expressways, is within 30 minutes from midtown Manhattan.

The formation of the *E. J. HOUDRY MUFFLER CO.* to equip motor vehicles with catalytic exhaust purifying devices which are required by law in California was announced recently.

E. J. Houdry, chairman of the board of *Oxy-Catalyst, Inc.*, and inventor of the catalytic process being used, made the announcement stating "all of the elements to make this process commercial have now been completely studied and tested."

Organization of the new firm caps a 14-months' crash program of engineering development to make the invention available at the lowest possible cost to the public.

Gordon P. Larson is president of the new company, a wholly-owned subsidiary of Oxy-Catalyst, Inc., Berwyn, Pa., of which he has been executive vice president and director for five years.

Larson, a retired Army Engineer, is a national authority on America's growing air pollution crisis. As Director of the Air Pollution Control District of Los Angeles County from 1948 to 1955, he conducted the research program which showed the effects of hydrocarbons and automobile exhausts and their relationship to the formation of smog in Los Angeles. As a result of these findings a major effort has been conducted over the past five years to find suitably engineered devices which would eliminate the menace of exhaust fumes in cities.

The catalytic converter to be demonstrated in California by the new E. J. Houdry Muffler Company has been under development for twelve years. Following an intensive program in its own laboratories and road tests which were completed in 1959, the General Motors Corporation signed a license with Oxy-Catalyst for the use of its patents in connection with the catalytic exhaust purifier. Since that time, Oxy-Catalyst has been making preparations for commercializing this product as a means of furthering its over-all efforts to combat atmospheric pollution.

Lee C. Churchill, General Sales Manager of *AMERICAN ALLSAFE CO. INC.* has announced an expansion program including the opening of an office and warehouse in Rochester and the addition of four Service and Sales Representatives in Western New York. For the past 40 years American Allsafe with head offices in Buffalo, have been manufacturers and national distributors of some 1,000 items of safety equipment for industry. *Willard F. Sterne* is President and *Norman J. Taylor*, Vice President.

The program includes the promotion of *Francis R. Sterry*, from Purchasing Agent to Service and Sales Representative for Niagara and Orleans counties. Mr. Sterry has been with the Company for the past 20 years.

Joining the Company as Service and Sales Representatives for Western New York are *Richard R. Zimmer* and *John D. Fyfe*, both of Kenmore.

The new Rochester office and warehouse at 907 Monroe Ave. will be under the direction of *Michael F. Gingo*, an authority on safety equipment and devices.

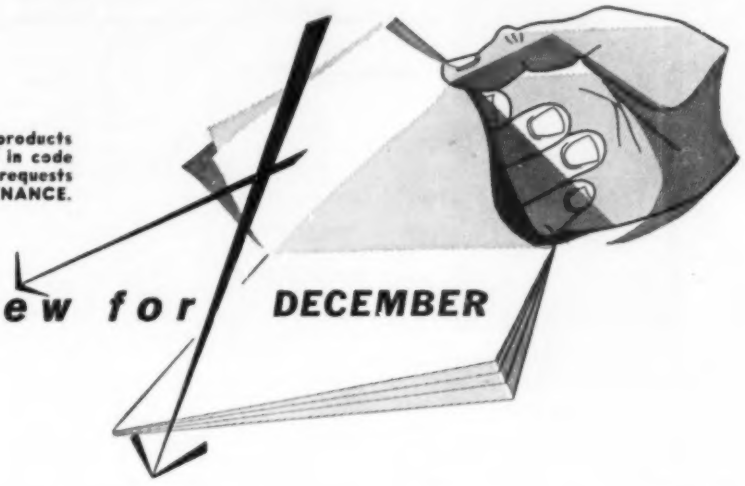
This is part of the expansion program of American Allsafe including new offices and warehouses in Erie, Pa. and Syracuse, N. Y.

Plans for the erection of Ohio's largest, most modern industrial lift truck sales and service center were announced recently by Gordon Patterson, president of *THE YALE & TOWNE MFG. CO.*

The $300,000 building, to be located in Walton Hills Village near the junction of the Ohio Turnpike and the North South Freeway presently under construction, will house the area sales and service activities of Yale Materials Handling Division. The Yale Northeast Ohio Branch will serve industry in Cleveland, Akron, Canton, Youngstown-Warren and Mansfield areas.

Material appearing in this section is published as information and is not intended to imply endorsement or guarantee by SAFETY MAINTENANCE.

To obtain descriptive literature of products listed, use Reader's Inquiry Card. Write in code number given each item. Send written requests to: Service Dept., SAFETY MAINTENANCE.



what's new for DECEMBER

SAFETY HAT WINTER LINERS

(Use Key # 926 on inquiry card on page 1)

SIX NEW WINTER LINERS are available from Jackson Products, Air Reduction Sales Co. Designed for outdoor industrial activities, these new liners are offered in a wide range of styles and prices. They fit all hats, and feature light-weight durable materials for warmth and ease of washing. The new metal-free design permits their use by any workers exposed to electrical shock hazards. Styles include Model FC-2 (shown) with ¾" deep all-orlon pile lining and model FC-4 which features a removable ear flap.

NEW SAFETY GLASSES

(Use Key # 927 on inquiry card on page 1)

A PLASTIC FRAME safety glasses line that features a universal bridge design has been developed by Sellstrom Mfg. Co.

who claim the product will fit nine out of 10 faces without adjustment. Sell-Fit glasses are built around a broad and continuous bearing surface for the bridge area that assures maximum comfort, even weight distribution and always-secure support. Offered in a choice of the popular broad-styled spatula temples or the improved vinyl coated cable temples. Available in models with side shields.

AUTOMATIC FUME DISPOSAL

(Use Key # 928 on inquiry card on page 1)

COMPLETE, ONE-STEP fume disposal is offered by Catalytic Combustion Corp. An integrated instrumentation system provides a fully automatic and safe operation. Utilizing metallic-supported catalysts to promote low-temperature oxidation or flameless combustion, the Catalytic Combustion Process converts noxious, hazardous, combustible fumes, odors and vapors, from a variety of manufacturing processes,

to harmless, odorless, colorless carbon dioxide and water vapor. As the oxidation reaction occurs there is a release of the latent heat energy contained in the fumes. This clean heat is often available for profitable heat recovery.

A typical Catalytic fume combustion unit, as shown, consists of an insulated sheet-metal housing containing pre-heat burner, catalyst elements, and exhaust fan, with attached control panel.

TOUCH SENSITIVE GLOVE

(Use Key # 929 on inquiry card on page 1)

A GLOVE SO sensitive that it can be worn while reading Braille, yet pliable and very tough, and with a high resistance to heat and chemicals, is being manufactured by the Charleston Rubber Co. The Sensi-Touch glove, made of milled neoprene, undergoes a multiple dip cement process. The company states that this is the first time a glove like this has been made available commercially. It has a satin interior finish, and is said to possess unusual flexibility and comfort. The absence of free sulphur or salts makes it satisfactory for handling fine instruments or parts which might otherwise be contaminated. The glove has a non-slip surface.

ELECTRONIC WARNING FOR BOOM EQUIPMENT

(Use Key # 930 on inquiry card on page 1)

A TRANSISTORIZED signal, engineered to provide a dependable means of warning both operator and ground crew of the approaching danger of contact with live overhead electric lines by boom equipment, has been developed by Wintronics. Sig-alarm Model TR-1 alarm circuits are actuated by the electrostatic field that surrounds all live power lines. Pre-set range can be from one to several hundred feet. The unit protects the entire length of the boom and provides both visual and audible warning. It is easily installed, and is reported to have fail-safe operation and be unaffected by weather.

PLASTIC CONTAINERS FOR FUNGICIDE SOLUTION

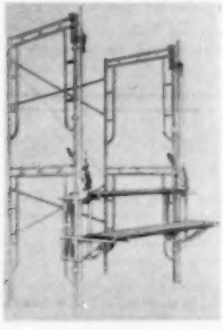
(Use Key # 931 on inquiry card on page 1)

A FUNGISTATIC solution used in shower rooms by schools, clubs and industries to stop athlete's foot, is now packaged in polyethylene jugs. Onox is now supplied in one-gallon plastic containers which save space and reduce weight and freight charges by 25%, according to the manufacturer. Because it is shatterproof, the container also eliminates freight claims and the hazard of breakage in shower rooms.

CHEMICAL DE-ICER

(Use Key # 932 on inquiry card on page 1)

A TRIPLE-COMPONENT formula that melts ice and snow on contact, yet is safe and completely harmless to landscaping, concrete, metal, carpeting and asphalt tile is announced by Pace Products, Inc. Called Propellant 49, this de-icer is said to build up tremendous heat energy when moisturized, and have a melting action up to 36 times faster than salt at 5°F. Thus, after the melting action, it leaves no residue, eliminating the possibility of track-in, and reducing winter clean-up maintenance. Propellant 49, cast lightly over walks before snow and sleet, will prevent ice from forming, and retains its effectiveness up to 36 hours.



ELEVATING BRACKET FOR SCAFFOLD USE

(Use Key # 933 on inquiry card on page 1)

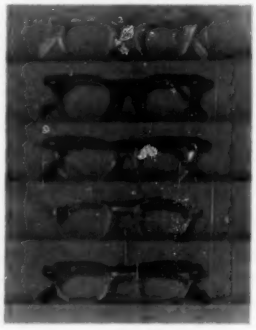
AN ELEVATING type side bracket, for use in connection with their standard scaffold set-ups, has been developed by Bil-Jax, Inc. Manually-operated hoisting units, used in pairs, make it easy to hoist men and materials to working level, without need of expensive equipment. The new traveling brackets employ winches made of aluminum, and feature a double ratchet principle for handling loads. The brackets are made of tubular steel and are equipped with safety devices for protection of workers against accidental descent.

SAFETY SPECTACLE LINE

(Use Key # 934 on inquiry card on page 1)

NEW EYEWEAR, combining maximum protection with distinctive appearance, has been introduced by Mine Safety Appliances Co. The Sightgard glasses are designed for a wide variety of industrial applications, providing high optical quality and impact strength. The eyewear is available in metal and acetate frames, various temple styles, and rigid and adjustable nose pads. Custom fitting is possible through a complete range of sizes. Side shields are available with acetate models. Also featured is a universal bridge for simplified stocking and fitting.

Many types of lenses, covers, and plates are provided including clear lenses in the



standard S-7 shape; lightweight plastic lenses where pitting is a problem; and ultra-filter lenses for protection against glare and impact. Round 50mm lenses and plates for chipper and welder eye protection; for filtering of sodium glare; for protection against pitting and spatter; and for use in visual reading of melt condition in steel operations. Also available is a complete "package" prescription service.

Sightgard frames are provided in acetate, metal, and acetate-on-metal. The acetate frames are resistant to combustion, for use where spark or explosion hazards are present. The metal frames are corrosion-resistant. The acetate-on-metal style has extra strength in bridge and endpiece areas. Side shields are provided in a perforated wire mesh, insulated wire mesh, a solid acetate, or a perforated acetate.

IMPROVED RESCUE SUIT

(Use Key # 935 on inquiry card on page 1)

A NUMBER OF recent improvements in the Fire King rescue suit have been announced by Wheeler Protective Apparel, Inc. A new, contoured headpiece offers panoramic vision and greater durability. The double windows are secured by new lock-on brackets that make them air and watertight and, when necessary, easily replaceable. The inner window is of a thick, heat resistant material of high transparency, and the outer window is 3M's new gold filmed, heat resistant plastic. The headpiece is constructed of fiberglas and resists heat, moisture, and impact. It is designed for use with a detachable head cradle or hard hat. The soles on the Fire King have increased traction combined with new heat resistant construction. A life line with belt can now be fitted to the suit.

THERAPEUTIC SKIN CREAM

(Use Key # 936 on inquiry card on page 1)

NON-SENSITIZING barrier cream which is also a therapeutic is being offered by Botan Pharmaceutical Co. The product, Kin, is a paste composed of lanolin, petrolatum and other ingredients. It disappears into the skin to form an invisible glove. The cream is also reputed to stop itching, promote healing, be effective against a wide range of bacteria, and be capable of use on a wide range of skin eruptions including first, second, and third degree burns.

OXYGEN-FIRST AID KIT

(Use Key # 937 on inquiry card on page 1)

A NEW KIT offered by the A. E. Halperin Co. contains an oxygen inhalator and an assortment of dressings and medications most suitable for emergency use. The Lif-O-Gen Oxygen Inhalant, containing a 7 gal. supply, or enough for up to 24 minutes of administration, is ready for immediate use. It is equipped with two easy-to-fit disposable face masks. The No. 75 emergency kit is housed in a 20-gauge steel container which is moisturepreof and dustproof. It is equipped with a gasket carrying handle and may be wall mounted.

SCAFFOLD OUTFIT

(Use Key # 938 on inquiry card on page 1)

A SUSPENDED CABLE scaffold outfit known as the Laho, is being distributed by Newark Ladder and Bracket Co. The cable drum and mechanism is enclosed in a housing which prevents chips, dirt, paint, etc., from dropping into the gears and affecting the safety and efficiency of the winch. A dual bicycle type winding handle combination makes it easy to wind up or down. Automatic brake action locks the winch in place the instant winding stops. The steel cable will carry a load of 1100 lbs. without slipping. Safety factor is said to be more than 400%. Due to a special mechanism, the cable can be connected to the roof hook from the ground in seconds, without turning the handles. Outfit carries Underwriters' label.

ABC-RATED EXTINGUISHERS

(Use Key # 939 on inquiry card on page 1)

TWO NEW pressurized dry chemical portable fire extinguishers, approved by Underwriters' Laboratories and Factory Mutual for all major classes of fire, have been announced by Fyr-Fyter Co. The units, available in a 20 and a 30 lb. model, utilize a dry chemical powder said to be so effective that it will extinguish deep seated, hard-to-kill tire fires.

After removal of the safety pin, and upon squeezing the unit's handle, the extinguishing powder is discharged in maximum volume, at a range 12 to 15 feet; the operator can thus maintain a safe distance from the blaze. The powder is non-conducting, non-toxic, and will not harm eyes or skin. Precision-made pressure gauge permits accurate visual inspection. Only normal maintenance is required, and the units can be refilled quickly after use.

AIR-TIGHT HEADGEAR SEAL

(Use Key # 940 on inquiry card on page 1)

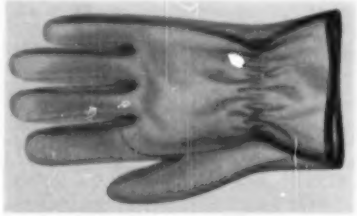
A BUREAU OF MINES approved, Tite Seal Headgear that produces a complete air-tight seal with just two adjustments—one on top and one in back—has been developed by Willson Products. Contour fitting plastic in the headgear allows easy, comfortable fit on any size or shape head. For anyone using the same mask all the time, adjustment can be made just once for even faster service. Safety hats and

fire helmets are worn without obstruction from the patented headgear. It is available on airline respirators and Willson's complete line of gas masks. Straps that once obstructed cleaning by dangling in the middle of the face-piece have been eliminated. Mask and headgear are cleaned easily and quickly with soap and hot water.

METAL PROTECTIVE FILM

(Use Key # 941 on inquiry card on page 1)

A LOW COST protective coating, known as CRC Soft-Seal, is being used to prevent corrosion of metals in production processess, storage and shipment. The product, which has an affinity for metal, penetrates grain boundaries, cracks and pores to form a continuous protective film from 1 to 8 microns thick. It eliminates the use of tenacious coatings and is applied by spray or immersion. Packaged in aerosol cans, the coating is said to be equally effective on iron, steel, aluminum, magnesium and plated finishes, and many other surfaces. The term of effectiveness varies with the conditions of exposure. It may last less than a year or more than 5 years. It never becomes dry, hard or brittle, the company reports. It is harmless to painted surfaces and is easily removed with live steam or solvents. The product is manufactured by Corrosion Reaction Consultants, Inc.



COLD WEATHER WORK GLOVE

(Use Key # 942 on inquiry card on page 1)

A NEW PROCESS of impregnating warm jersey gloves with non-slip vinyl is reported by Edmont, Inc., the manufacturer, to give at least 10 times longer wear. Other benefits stated are positive safe grip, oil and water repellency and retention of the flexibility and comfort of ordinary jersey. Palm is heavily coated; back is lightly impregnated to resist scuffing but let the fabric "breathe." This new glove, called Tuf Duk, is designed for outdoor work, cold rooms and refrigerated products handling.

LOW TEMPERATURE THERMAL INSULATION

(Use Key # 943 on inquiry card on page 1)

PREFORMED RIGID, self-extinguishing, urethane closed cell foam is finding wide use because of its superior insulating properties, its handling ease, and its ability to cut application costs, reports the Fibrous Products Div. of Union Asbestos & Rubber Co., makers of Unarco U-200. It is employed to insulate low temperature piping and equipment in homes, churches, commercial buildings, ships, and industrial plants. The product U-200 is a polyester urethane foam blown with Genetron fluorocarbon gas, its K factor at 70°F. is 0.14, lowest of any preformed cold insulation material.

The rigid foam comes in half-round sections, each section 36 inches long. Available in nominal thicknesses and in standard pipe and tubing sizes. The product is also supplied in 12 x 36-inch block form increments. Temperature limits for the insulation are from −300° to +200°F. With a closed cell content of 85 percent, the foam is essentially waterproof. The company, however, recommends that a separate vapor barrier (usually a mastic) always be used with Unarco U-200 for cold insulation purposes. The foam is not affected by mastics, sealers, or most solvents.

HIGH VOLUME AIR SAMPLER

(Use Key # 944 on inquiry card on page 1)

A HIGH CAPACITY air sampler has been developed by Gelman Instrument Co. This new unit collects samples of dusts and aerosols in air rates up to 200 Cubic Feet per Minute, or twice that of previously available instruments. The instrument is powered by a 2-speed, one horsepower motor. Its cast aluminum housing and rotor, ball bearing motor, vibration isolating suspension mounting, and heavy duty brushes make it rugged, yet easy to handle in field use. A new system of air measuring gives laboratory accuracy of flow measurement by means of a dial reading orifice gage. Filter holders accept 4 inch diameter filters which easily lock in place. The entire filter holder assembly can be removed for quick changes in the field. Collection of dust samples is said to take minutes instead of days.

NEW FLOOR LINE MARKER

(Use Key # 945 on inquiry card on page 1)

A NEW PAINT marker called Flor-Line, for use on all surfaces, has been announced by Consolidated Paint & Varnish Corp. The lightweight unit features a gravity-feed principle and a new type of roller application. Paint is fed from the built-in tank directly through self-cleaning (non-clog) multiple brass valves onto the marking roller. The multiple-feed and roller application make for smooth, sharp lines on even a rough surface or wood flooring full of cracks.

The unit has fold-back or retractable guide wheels so that it can roll vertical lines right up pillars or walls. The vertical lines remain visible when lines on the floor may become worn or covered. A trigger in the unit's handle permits the operator to control the flow of paint, for either continuous straight or curved lines, or broken lines. Lines may be made in 2", 3", and 4" widths. The sealed paint container eliminates danger of spilling.

LIFTING CLAMP ADAPTER WIDENS RANGE OF GRIPS

(Use Key # 946 on inquiry card on page 1)

A DEVICE made available by Merrill Brothers for use with their Special Opening "G" Clamp increases this clamp's range of grips and eliminates the need for another clamp where large variance in grip would ordinarily require its use. A 1-ton with ¾" x 1⅜" grip can be converted into a clamp having 0–¾" grip by simply slipping the adapter into position. This provides one compact lightweight clamp to handle 0 x 1⅜" materials. A 3-ton 1¾" x 3⅛" can be converted to 1¼" x 3⅛". Adapter unit complete with pad, can be replaced when worn. It slips in and out without use of tools.

VACUUM FOR RADIOACTIVE & TOXIC DUST HANDLING

(Use Key # 947 on inquiry card on page 1)

A PORTABLE VACUUM cleaner providing for the safe collection and handling of radioactive and toxic dusts is announced by Cambridge Filter Corp. Heart of the unit is a Cambridge Absolute filter of special design to permit its easy removal and replacement in order to control the hazard of recontamination during filter change-over. Each filter is tested for a minimum efficiency of 99.97% on particle sizes of 0.3 microns. A special gasketed flange provides a tight air and dust seal for the cylindrical filter.

Air is prefiltered through a high-efficiency Dacron bag supported on a special frame assembly which permits self-rejuvenation of the bag during operation. The bag is retained in a full open position during operation, providing for its safe removal from the vacuum cleaner without collapsing and redistributing collected dust. The collection tank with a recoverable capacity of 1⅗

bushels of dry material is quickly released for cleaning or emptying by a touch of the toe on the release bar. The unit is also suitable for modified wet pickup.

TOXIC SOLVENT CAN

(Use Key # 948 on inquiry card on page 1)

A NEW DISPENSING can for toxic solvents, introduced by The Protectoseal Co. protects the user from accidental contact with toxic liquids used in cleaning and finishing operations, and eliminates the toxic vapor hazard by means of an automatic, self-sealing well. By preventing the solvent vapors from escaping into atmosphere, the can also reduces evaporation losses of expensive solvents.

To moisten a small swab or brush, the user places it in the plunger type well and depresses the assembly with one or two fingers. This dips the brush into the solvent. Upon release of the spring loaded plunger assembly, the excess liquid flows back into the can and the liquid opening

is re-sealed. The cans have a wide, low base for maximum stability to prevent tipping and spilling of the contents. Terne plate construction provides inside-and-out lead coating for resistance to corrosion. Liquid capacity is ½ pint.

FOAM FIRE-FIGHTING UNIT

(Use Key # 949 on inquiry card on page 1)

A NEW UNIT with a foam capacity of 600 gallons per minute, designed for "first aid" fire fighting in plants handling flammable liquids, is available from National Foam System, Inc. The Aer-O-Foam Station, operated by one man, produces foam in quantities adequate to fight sizable fires for periods up to 30 minutes, or long enough for heavy-duty foam trucks and other equipment to be brought into action. Each station consists of a steel cradle, a 55-gallon supply of Aer-O-Foam liquid, a line proportioner and an RP-6A Nozzle connected with 100 feet or 150 feet of 1½" hose. It can be installed simply by piping the inlet to a source of water at suitable pressure.

To start fire-fighting action, the operator simply removes the canvas cover, strips out the hose, inserts the pickup tube in the special vent in the top of the tank, and opens the water valve. Foam begins flowing in seconds. 125 pounds of water pressure provides a foam stream up to 50 feet in length. Refineries, chemical processing plants and marketing terminals can utilize the Aer-O-Foam stations in locations such as pump house and manifold pit areas, truck and tank car-loading racks, marine docks and other hazardous points.

CONTAMINATION SUIT

(Use Key # 950 on inquiry card on page 1)

A COVERALL which seals out radioactive and other harmful substances has been designed by Sawyer-Tower for work in contaminated chambers. The suit is left in the chamber. It is entered by crawling into the far end of the tube which is sealed

over the entrance door to the chamber. A team partner, located in an alcove outside the chamber, keeps in touch with the worker in the suit and supplies air to him through the tube, by means of a water pressure system.

The suit is made of vinyl-coated nylon, with rubber gloves attached by polypropylene rings to the sleeves. Boots of the same material are sewed on. All seams of the garment are thoroughly sprayed to seal them completely. Distributed by Mine Safety Appliances Co.

PROTECTIVE SUIT FOR MICROWAVE RADIATION

(Use Key # 951 on Inquiry card on page 1)

AN RF RADIATION protective suit that affords complete protection from the harmful biological effects of electromagnetic radiation has been developed by the Filtron Co. Tradenamed the Attenu-Suit, the one-piece garment is said to have a shielding effectiveness of 50 DB over a frequency range from 30 MC to 1000 MC, and is arc resistant to a potential up to 4000 volts. It permits continuous operation during necessary inspection, repair and maintenance in high level radar fields. Tests show the protective suit can be safely worn in areas where the RF level is 10,000 times greater than the USAF maximum safe limit of 10 milliwatts per square centimeter.

Consisting of four layers of material, and with a patented safety lock closure to maintain positive shielding integrity, the Attenu-Suit will remain pliant and flexible down to -40°F. Its outer layer (neoprene coated black nylon), interlining (specially treated nylon mesh processed to reduce radiation by reflection), and cotton lining, combine to make the suit strong, comfortable and lightweight (10 lb.). A high-visibility shielded visor permits 130° of vision.

ELECTRICAL SAFETY HATS

(Use Key # 952 on Inquiry card on page 1)

FABRICATED FROM new-formula plastic, a line of electrical headgear from Boyer-Campbell Co. is designed to offer protection from shock as well as impact. The hats meet and exceed E.E.I. specifications. Another feature is their ability to resist impact, withstanding 40 foot pounds without showing visible structural or material weakness. Penetration depth of the material is only one-quarter inch, much less

than the three-eighth-inch depth permitted by the specification. The hat shell material is uniformly strong, corrosion-resistant and maintenance free; it permits instant visual detection of even minute damage.

COMMUNICATOR EAR GUARD

(Use Key # 953 on Inquiry card on page 1)

A NEW ADDITION to the Straightaway Line of Ear Protectors from the David Clark Co. is a communications model, 372-SBM. The lightweight mike shield encloses a noise cancelling, extended frequency microphone, activated by either a push-to-talk button or toggle switch located on the outside of the shield. Adjustable chin straps of nylon hold the shield in a comfortable position. Ear seals and microphone seals may be removed for easy

cleaning, and the head pad for replacement whenever necessary. High db. applications include jet engine trim testing of 707's, DC8's and Electras.

NEW FLOOR RESURFACER

(Use Key # 954 on Inquiry card on page 1)

A THERMO-SETTING plastic floor topping has been developed by the Monroe Co. Zelonide is designed for use in bottling plants, dairies, meat packing plants, canneries, breweries, laundries, chemical plants and laboratories. It is reported to have exceptionally adhesive qualities and resistance to most acids, alkalis, oils, greases and detergents as well as thermal shock and moisture. The topping bonds firmly and completely to concrete, metal and wood, forming a hard, dense, impermeable surface, withstanding wet heat up to 212°F. Under most conditions, it is ready for traffic within 24 hours.

Independent laboratory tests have proven Zelonide to possess 4 times the tensile and compressive strength of concrete and 10 times its flexibility, the company states. It is non-shrinking, non-dusting, and lightweight.

DUST RESPIRATOR TESTING AND CLEANING DEVICE

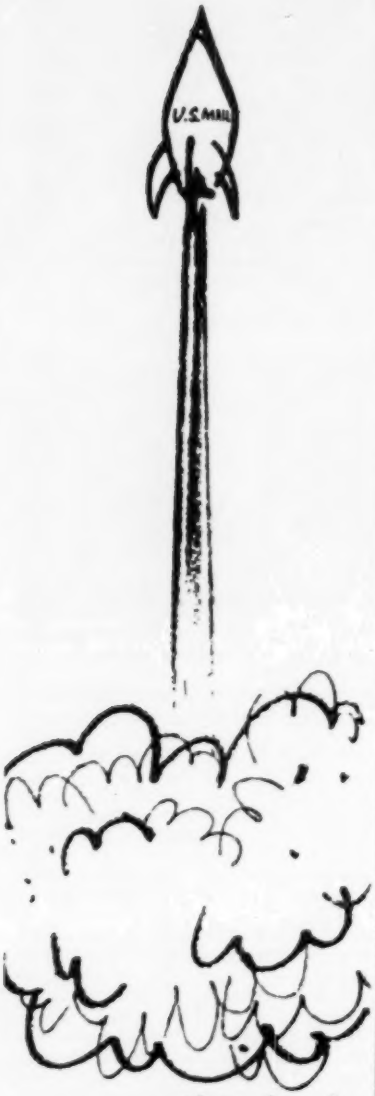
(Use Key # 955 on Inquiry card on page 1)

A COMPACT and versatile set of equipment for the maintenance of dust respirators has all of its components mounted on one base. It permits testing the air resistance of dust respirators and also cleaning their filters. The two sockets, one for testing and the other for cleaning, can be adapted with separate fittings for use with any style of respirator. The Draeger Testing and Cleaning Apparatus has air flow meter calibrated to the equivalent of 1.06 cu. ft. and 1.77 cu. ft./min. In testing the respirators or filters, as shown in the picture, the resistance to the volume of air flow passing through the equipment is read directly on a vacuum gauge dial. For cleaning, the socket (shown at left in picture) is merely turned to the "suction" position and the filter inserted in the socket. This vital equipment for users of dust respirators is available from New Jersey Safety Equipment Co.

ALL-PURPOSE DETERGENT

(Use Key # 956 on Inquiry card on page 1)

A NEW CONCENTRATED synthetic detergent, for use on the grimiest machine parts, has been announced by Consolidated Paint & Varnish Corp. Called Goodyear All Purpose Cleaner, it is designed for use on anything from removing grease and oil from mechanical parts and machinery, to keeping floors and buildings clean, to washing hands after grimy jobs. It is reported to have an effective penetrating action, yet be harmless to both metal surfaces and skin. Odorless and non-toxic.



zone mail indeed results in speed

The Post Office has divided 106 cities into postal delivery zones to speed mail delivery. Be sure to include zone number when writing to these cities; be sure to include *your* zone number in *your* return address — after the city, before the state.

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SEND THIS PERSONAL SAFETY MESSAGE TO EVERY ONE OF YOUR EMPLOYEES.

- Safety is made appealling . . . vivid . . . engaging . . . colorful!
- Each worker clearly sees how safety benefits him . . . how doing his part helps others!
- You get enthusiastic safety cooperation instead of tolerance . . . from every employee . . . every month!

. . . talks the worker's language!

YOUR IMPRINT HERE!

packed with pictures, alive with animated cartoons, touched with humour that gives snap to your message, it makes safety interesting and down to earth. Twelve times a year it covers accident hazards. Across the nation leading industrial firms state it's the only safety paper their employees will read . . . and take home to their families.

It gives the employer the advantages of personal contact . . . saves time and expense. One "lost time" accident prevented . . . more than pays for the yearly cost! Try it . . . it works!

YOUR SIGNATURE HERE!

Make Your Safety News your own publication . . . your good will ambassador . . . working for you toward better industrial relations. If you wish, your facsimile signature can be printed here to identify you with the message that gets next to your men and boosts morale.

NOTE: *Your Safety News* is designed to promote better employer-employee relations. Every item is carefully weighed and tailored to this viewpoint!

INSIDE PAGES
(Pages 2 and 3)

THOUGHTLESSNESS IS A THIEF
He'll steal his way into what you're doing, distract your attention and walk off with a finger, arm, eye or foot. Thoughtlessness takes many forms: it may be daydreaming, or worry about some personal problem, or just plain inattention. Anything that distracts you, especially around machinery, is a thief of your personal safety.
PLAYFULNESS IS A PIRATE
He is a disruptive rascal. He happily may put him in the spotlight, but his practical jokes and showing-off often result in serious bodily injury and even death. And note this: he, himself, has lost a leg! As so often happens, horseplay can boomerang and the practical joker gets hurt too!
AN INTIMATE LOOK AT FOUR VILLAINS
What You Should Know About Carbon Monoxide
This is a picture of carbon monoxide gas!
That's right, you can't see it. It's odorless, non-irritating, non-toxic, practically odorless, but also deadly.
Here are the symptoms of carbon monoxide poisoning: first, a tight feeling across the forehead, followed by headache, throbbing temples, weariness, weakness, dizziness, nausea, loss of muscular control, increased pulse and breathing. BUT if the concentration of the poison gas is high, there may be loss of consciousness without these warning signals.
Just a few breaths of air containing 1% carbon monoxide can be fatal . . . as can one part of carbon monoxide in a thousand parts of air when breathed for 90 minutes.
It is possible for carbon monoxide to leak inside of a car if there is a loose exhaust pipe or manifold connection, blown-out exhaust gasket, cracked exhaust manifold, or leaky muffler. Play it safe.
1. Be sure your muffler and exhaust are in good condition (they can last long before they become noisy).
2. Always keep a car window open, even a little, for fresh air.
SAFETY LAZINESS IS A SIMON LEGREE
If you are lazy about safety rules, then accidents will have the whip hand. We are safety-lazy when we don't bother to use mechanical guards, to take time to get the right tools for the job, to wear protective equipment such as goggles, hard hats, safety shoes, respirators, gloves, etc. Yes, Simon Legree has a whole pack of accident hounds to trail you.
HAZARDOUS METHODS ARE A HOLD-UP MAN
This villain, unsafe work habits, likes to lie in ambush for the unwary. But how do we fall into bad working habits? It may be by trying to cut corners, by wanting to keep to the old way of doing things, or by over-confidence. It's hard for anyone to believe that an accident can happen to him. It's easier to make excuses to ourselves for ignoring safety rules, but all too easy lead on up a blind alley with an accident waiting in ambush!
Two Excellent Reasons
For Wearing Safety Shoes

EMPHASIZES SELF INTEREST

Your employee's self interest in his own safety is always emphasized. Constant safety consciousness is promoted by covering household hazards, transit to and from the job and on the job caution against accidents.

CLEVERLY ILLUSTRATES THE POINT

Artwork is carefully chosen to lodge home each point persuasively. The cartoon style makes YOUR SAFETY NEWS as familiar and welcome as the picture packed Sunday supplement.

WINS READERS WITH A FOLKSY APPROACH

Keeping the contents folksy, adding the light note of humor, gets your message across with a nudge instead of a bludgeon. Your monthly chat gets enthusiasm instead of indifference.

RIVETS ATTENTION WITH VIVID COLOR

Generous use of color sparks the message, and adds impact to the contents of YOUR SAFETY NEWS. Each issue is as alive as any news-stand favorite.

HOW TO ORDER:

YOUR SAFETY NEWS may be ordered with either the standard imprint or with your Own Special Imprint. The standard imprint reads "PLEASE COOPERATE FOR THE SAFETY AND HEALTH OF ALL . . . signed . . . A SAFE WORKER."

You can personalize YOUR SAFETY NEWS with the name of your firm and the name or facsimile signature of a company representative as illustrated. Give full instructions for your Special Imprint on the order blank below:

Item (1) FIRM NAME: Please show the name of your firm exactly as it is to appear.

Item (2) INDIVIDUAL NAME OR SIGNATURE: (If Desired). On a sheet of white paper, please show, in blank ink, the individual name or signature, if desired, which is to appear each month on the first page of YOUR SAFETY NEWS.

NOTE: Although a personal signature is effective, some firms substitute: SAFETY DEPARTMENT, YOUR SAFETY COMMITTEE, A SAFE WORKER, etc.

CUT OUT AND MAIL TODAY!

ALFRED M. BEST COMPANY, Inc. • 75 Fulton Street, New York 38, N. Y.

Gentlemen:

Until further advised please publish for us each month _____ copies of YOUR SAFETY NEWS at _____¢ each.

☐ Special Imprint ☐ Standard Imprint

Item (1) The Special Imprint of our company name should appear as follows: _____

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6,001 copies and over	2½¢ each	2¢ each	200 to 500 copies	5½¢ each	4½¢ each
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1,001 to 3,000 copies	3½¢ each	3¢ each	25 to 99 copies	**	5½¢ each
501 to 1,000 copies	4½¢ each	4¢ each			

** 5½ each plus $3.50 per month. For Special Imprint. F.O.B. New York, N. Y.

"Our people jumped at the chance when we offered the Payroll Savings Plan"

"We invited every employee in the company to come along with us on the Payroll Savings Plan and invest in U.S. Savings Bonds regularly. The response was excellent. People appreciate having the tough job of saving done *for* them—and a lot of them took time to thank us for it. And besides feeling good about building a nest-egg, they're proud to be part of an effort that helps keep our country strong. This Plan makes them feel they 'belong,' and that's the best kind of personnel relations."

If your company hasn't gotten around to putting in the Payroll Savings Plan, contact your State Savings Bonds Director and let him show you how simple the Plan really is. Get his experienced help in presenting the Plan to your organization. Or write Savings Bonds Division, U.S. Treasury Department, Washington, D.C.

ALL U.S. SAVINGS BONDS—OLD OR NEW—EARN ½% MORE THAN BEFORE

SAFETY MAINTENANCE

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THANTIS Lozenges have a twenty-nine year record of proven safety and effectiveness in clinical and lay use.

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MERCUROCHROME should be used promptly to prevent infection. No antiseptic has been proven to be more effective than MERCUROCHROME for topical application.

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(For details, use Key # Z-17 on card on page 1)